

V O K S

B U L L E T I N

1945

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V O K S

B U L L E T I N



No. 7/8

U. S. S. R. S O C I E T Y F O R C U L T U R A L
R E L A T I O N S W I T H F O R E I G N C O U N T R I E S

Editor - in - Chief
VLADIMIR KEMENOV

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Group of Soviet and Foreign Scientists Attending the Anniversary Session of the U. S. S. R. Academy of Sciences

ANNIVERSARY SESSION OF THE ACADEMY OF SCIENCES OF THE U. S. S. R.

By V. L. Komarov, Member of the Academy

DURING the very celebration of the anniversary, those who took part in it already felt that this was no ordinary jubilee, but a great historical event in the political and cultural life of the state. And even now, when the anniversary is over, the holiday spirit and the consciousness of the session's historical importance have not disappeared. It may be asked: just what made this session of the Academy of Sciences an event of historical importance?

The most outstanding result of the session, it seems to me, was the universal recognition of the extreme importance of science in modern life. During these great historical events, days crowned with victory over Germany, the government and the people have accorded science and scientists the greatest honour and attention. In a personal interview, Joseph Stalin once told me that each soldier of the Red Army at the front had personally experienced the benefits of advanced science.

That is why the victory over Germany did not eclipse the Academy's celebration, did not diminish its brilliance, but on the contrary, served to increase the grandeur of this scientific jubilee, to make it an event of profound historical and social importance.

The war with Germany was a vivid demonstration of the characteristic features of the present era, and particularly—of the great importance of science in warfare, engineering, industry, culture and social psychology. Modern warfare is based upon applied natural science. In order to win a modern war it is not enough to make use of the known principles of scientific engineering: they must be continuously developed, elaborated and adapted. At the modern rate of progress in scientific engineering a high level of development in engineering is not enough to guarantee victory. A high, so to say, "differential in time," that is, a high rate of advance in the technical level, is also essential. That

is just what we had in the Soviet Union. Soviet engineers, constructors and scientists are innovators. They are never satisfied with what they have achieved, however good their achievements may be. They are ever seeking, inventing, creating. And this is one of the main reasons why science is so dear to the Soviet people. People who are themselves innovators, creators, cannot help loving science, cannot help showing it the fondest care and attention.

The war has shown that science is of utmost importance in war economy. With the outbreak of the war we not only continued our expeditions, prospecting, etc., but were compelled to increase and expand our work immensely. I remember how in 1941, within the space of only a few weeks, we found new sources of raw materials, fuel, hydro-electric power, etc. for evacuated plants and for the new industries which sprang up to meet wartime needs. We were able to do this because the search for mineral resources had been going on previously in all regions for a great number of years, because theoretical science in our country had reached a high state of development, because geological prospecting, for instance, was based upon the ideas of such thinkers as Vernadsky and Fersman. Another factor of great importance was the fact that Soviet industry was based mainly upon a system of plants and factories put up during the Five Year Plans in accordance with the most advanced ideas of modern science and engineering. Close contact between science and practical engineering is a distinguishing feature of the Soviet system, and this feature among others stood out especially clearly during the war.

The manufacture of new instruments of warfare, the creation of new technological processes in war industry, the utilizing of new sources of raw materials, energy and provisions, the introducing of new methods—these are the main contributions of science to the defeat of the enemy. But this is far from being all...

Our victory came as the result of a harmonious combination of modern military engineering and the specific qualities of Soviet warriors: bravery, initiative, shrewdness and intelligence. Each kilometer of our front was covered not only with several hundred cannon, but with hundreds of first-class soldiers as well. They were pitched against the dull and malicious, but numerous and well-armed Hitlerite hordes.

A heroic effort of the whole nation made it possible to supply our troops with weapons more powerful than those used by the enemy. But our people were stronger than the enemy morally as well. They were courageous, firm and steadfast. All this can be expressed in one word: they were Soviet people.

It is difficult to estimate the influence which the most outstanding scientific theory known to mankind—the teachings of Marx, Engels, Lenin and Stalin—has upon us. It has put us into the habit of regarding social phenomena from a scientific point of view, of analysing, of searching for the cause and deducing the consequence, of looking into the future not on the basis of momentary mood, but of objective factors. We knew of scientific foresight: we had even seen examples of it in all fields of science, and that is why we never lost confidence in our victory for even a moment. When Joseph Stalin put before us his ingenious analysis of the strategical, economic and political factors of the war, we could see that the collapse of fascism was inevitable. The result was that calm heroic confidence with which the Soviet people warded off all enemy attacks. The memory of the past history of our nation also helped to increase the patriotic effort of the Soviet People. A consideration of the history of science, for example, could not but increase our hatred for fascists, for those who wanted to burn and stamp out the cultural heritage of mankind. Not only the scientific works themselves are of great importance, but also the scientific conception of the world, the scientific approach to politics, labour, to life as a whole.

During a personal interview I had with Joseph Stalin in June of this year, he approved the idea of publishing a scientific encyclopedia for young people—*The Young People's Encyclopedia* which is to give the new generation the knowledge it needs for a modern outlook on the world, and is to develop confidence and courage in all their work. It seems to me that this also goes to confirm the statement about the important part played by science in cultivating those characteristic features of the Soviet person, to which mankind owes so much for the victory over fascism.

Thus, science has played a tremendous role in the salvation of civilization, in the defence of the honour and freedom of our native land. That is why, when the military leaders to whom humanity must ever be obliged for its salvation

gathered at a banquet after the Victory Parade in Moscow, they raised a toast to men of science. That is why the anniversary session of the Academy of Sciences was so closely bound up with the victory festivities, and that is why the Soviet nation is so solicitous of and devoted to its Academy of Sciences.

This session was the nation-wide acknowledgment of the immense importance of science in military, civil and cultural affairs. But at the same time it was also a universal acknowledgment of those advantages which the Soviet system offers to the development of science. Foreign science was represented at the session by some of the greatest thinkers. They carefully examined our laboratories, institutes, museums and libraries, took part in scientific meetings and told of their impressions in speeches and personal interviews. They were struck by the attention paid to science by the government and the people, by the huge material basis afforded for research, by the extensive plans for the development of science, by the huge number and great value of the results attained in science and their rapid application to practice. Thus, once more the remarkable prophesy made by the great Russian writer Belinsky one hundred years ago has come true. Belinsky stated that in the twentieth century Russia would give the world wonderful examples of science and culture and would receive a tribute of gratitude and admiration from other peoples. In the past Russian scientists also did much for the world. But now they give the world and science not only remarkable discoveries but also astonishing examples of the application of science to everyday life. I should like to dwell upon this point in more detail.

At the first meeting of the session I referred to the 18th century as the Age of Reason, to the 19th century as the Age of Science, and to modern times as the age of the universal application of science to everyday life, the universal reorganisation of engineering, of social forms and even of nature itself in accordance with demands of reason and science. The most important event of our age was the formation of the Soviet order, the creation of harmonious social forms. This new order has shown its advantages in regards to the development of industry. These advantages were realized during the Five Year Plans. This new order

stood the greatest test which history could put—the invasion of a ruthless enemy, who had at his disposal all the productive forces of the European continent. In the struggle against this enemy Stalin's genius rallied all the political, economic and military forces of Soviet society, and they turned out to be so powerful that the enemy was smashed. The victory over Germany was a demonstration of the incalculable forces called to life by Soviet construction. Harmonious social forms guarantee a high level of industry. The anniversary session of the Academy was an important stage in the acknowledgement of this fact.

The session had a third result, which had to do with the Academy of Sciences itself and with the part it has played in the Soviet State. It seems clear that the Academy of Sciences is the nation-wide centre of Soviet science. In the 18th century it played no such role. Apart from the Moscow University and the Russian Academy it had no periphery, no other scientific institutions connected with it. In the 19th century and during the first quarter of the 20th century there existed alongside the Academy a great number of scientific centres, universities for the most part, which were more closely connected with Russian society and with the progressive trends in social ideas. But at present, in the Soviet State, where all branches of science are united in a monolithic whole, the Academy has become in 20 years the centre of a whole complicated network of scientific establishments, including industrial scientific establishments as well as educational institutions. The Academy includes the greatest and most widely acknowledged workers of all branches of knowledge and is therefore fully authorized to direct complex researches designed to develop Soviet engineering, culture, the welfare of the nation and the power of our State.

Such, in brief, are my impressions of the results of the anniversary session of the Academy of Sciences. However, these lines can hardly express the feeling of great happiness that fills my heart and those of other scientists. We have had the good fortune to be contemporaries of and participants in the great historical act of destroying the fascist menace to the very existence of mankind, and of inaugurating an unprecedented period of prosperity and culture and science.

COMMENTS OF FOREIGN SCIENTISTS WHO ATTENDED THE TWO HUNDRED AND TWENTIETH ANNIVERSARY SESSION OF THE U. S. S. R. ACADEMY OF SCIENCES

AS A MEMBER of the American delegation to the 220th Anniversary of the Academy of Sciences of the U. S. S. R. I have been profoundly impressed, not only by what I have seen of the scientific activities of the Soviet Union, but by the people in their determination to carry forward in spite of a devastating war the established programs for national development. This determination I have seen, not only in the Institute and laboratory but on the street, in our hotel, at the theatre and wherever I have had the opportunity to see work of rehabilitation.

Science in the Soviet Union is considered to be a national natural resource and has such status with the Soviet Government. Organized as it is by "institutes" the greatest flexibility can prevail in coordinating the work between institutes and between a particular institute and a particular need for scientific research or the solution of a particular problem in the national program. Such organization minimizes duplication without destroying incentive and healthy competition.

In my own field, that of hydrology, I found the State Institute of Hydrology at Leningrad well advanced in developments directed toward the improvement of instruments and techniques for forecasting the flow of streams; the condition and movement of ice; the measurement of sediment carried by the rivers and to the solution of problems of irrigation and navigation. At this institute I was shown one of the most complete exhibits I have seen of hydrologic instruments and technical displays.

At the Geophysical Institute I was shown plans for new laboratories and scientific equipment for meteorological studies of the atmosphere. These researches will give particular attention to the turbulent layer at the

earth's surface and to the stratosphere. I found the Institute staff very much interested in American methods for measuring evaporation.

The general sessions of the Academy of Sciences were inspiring to all visiting scientists. These sessions provided the opportunity to present formal greetings to President Komarov.

Memories of the many social events, the great celebration of June 24th, the sight-seeing tours, the theatre, the ballet and particularly the banquet at the Kremlin will remain with us.

Soviet scientists have taken the leadership in preparing the way for full and friendly collaboration in all fields of science. It remains for us all to nourish and cultivate the seeds of cooperation planted at the 220th Anniversary, Academy of Sciences, U. S. S. R.

From *Merril Bernard*

Hydrologic Director U. S. Weather Service
Washington D. C., U. S. A.

ALTOGETHER I am deeply impressed by the hospitality and kindness shown us. Everyone seems eager to build up what has been destroyed by the war and there seems to be a general and genuine wish to live in peace with the world. I feel that this 220th celebration of the anniversary of the U. S. S. R. Academy of Sciences is a mile-stone in history. Russia has taken the lead in bringing together, immediately after the fall of Germany, scientists from all over the world. These international meetings of scientists are not only of great importance for the further development of science, but also for the further cultivation of good international relations. More than ever I feel now that we have to strengthen the relations between the

U. S. S. R. and the U. S. A. This can be done by an exchange of professors and other scholars between the two countries, by making available fellowships for students and young scholars who have just received their doctor's degree. Furthermore, we should try to arrange for international meetings in highly specialized subjects, so that experts in a certain field from all over the world would have a chance to meet together. Moreover, it is very important that in America courses be given in Russian, so that students and scholars will be able to read Russian publications. On the other hand, probably more attention should be paid to the study of English in Russian institutions of learning.

For many years I have been acquainted with some leading Academicians, like Professor A. Frumkin (Moscow) and Prof. J. Frenkel (Leningrad). I always have admired their work and cherished my friendship with them. This friendship has been strengthened by the present visit. I have spent much time in Prof. Frumkin's institute in Moscow, where I was shown many new fundamental experiments and in the Physico-Technical Institute in Leningrad (Prof. Joffe director) where the theoretical work is directed by Prof. Frenkel. I have had many interesting and valuable scientific discussions with many scholars (for example Medvedev, Frumkin's group; Kapustinsky, Talalaev, Grinberg, Nikitin, Ratner and especially Kobeka, Alexandrov, Bresler—last three in Leningrad). I am genuinely impressed by the fundamental work which is being carried on in the various institutes. Those researches belong to the best to be found anywhere. As an analytical chemist I was grateful to find such an interest in analytical chemistry. I gave a talk in the Geochemistry Institute and then was asked questions for two hours. These questions showed a keen, intelligent interest in analytical chemistry. Afterwards I saw part of the institute and was impressed by the fine work being carried out on spectrography (infra-red, visible light; X-ray spectrography), by polarographic and radiometric equipment.

This visit to the U. S. S. R. is a mile-stone in my life. We have been shown the best in the field of science and art. The ballets, operas, theatre performances, the variété-concerts, etc. are the most magnificent performances I have ever seen.

Certainly, a country which plays such a

leading role in science and art is destined to play a leading role in world affairs. Its science and culture demonstrate the strength of a country. May the Academy of Sciences of the U. S. S. R. have a future which is at least as brilliant as its past.

I. M. Kolthoff

Prof. of Analytical Chemistry,
University of Minnesota, Minneapolis

I HAVE been exceedingly favourably impressed by what I have seen of Russian scientific work in chemistry and physics. All the institutes which I have visited seem to be very well equipped for research on a very comprehensive scale: in particular the institutes headed by Academicians Joffe, Kapitza, Semenoff, and Frumkin are working as very enthusiastic teams, with almost every conceivable facility, on fundamental scientific problems and their application to human needs.

The way in which we have been enthusiastically welcomed as colleagues with many interests in common, not only by the heads of the institutes but also by all other workers in the institutes, shows a depth of friendly feeling which cannot fail to promote wider contacts between the peoples of all countries in which scientific investigation flourishes. I expected to be coming to a somewhat strange and foreign country on this visit: but I have never felt, when in the laboratories, more completely at home. There is no real difference between us; as one of our devoted guides said to me, reporting a conversation she had had with a friend, who said "Are these English? They are just like us!" I feel precisely the same about our most kind Russian friends.

It should be easy, when free and rapid correspondence and frequent interchange of visits between individuals in Russia and other countries becomes possible, to strengthen the ties which your hospitality on this occasion have begun to favour. We, as individuals, have so many scientific and artistic interests in common, that once free intercourse again becomes easy, friendship cannot help growing. I hope, therefore, that not only shall we have other congresses in many lands at which we all shall meet again; but also that we shall visit each other as individuals free to travel at will to and within each others' countries, so that each

country can share its treasures of thought, of science and art, and compare the social and political institutions on the basis of first-hand acquaintance.

N. K. Adam

Professor of the Chemistry,
University of Southampton

IT GIVES me very great pleasure to speak in the highest terms of the great hospitality and kindness I have received in Moscow and Leningrad on the occasion of the Jubilee celebrations of the 220th Anniversary of the Foundation of the Academy of Sciences. I have been deeply impressed by the splendid scientific Institutes I have seen, by the immense amount of first quality scientific and technical research being carried out in these splendidly equipped Institutes, and by the originality, energy and skill of the famous Directors and their most able assistants. These will surely sponsor every prospect of collaboration between the scientists and technicians of the U. S. S. R. and those of my own and other countries.

The very great importance attached to the development of science and its applications by the leaders of the Soviet Union is of the highest significance, not only for the future of your great countries, but also for that of other nations, and indeed for the development of civilisation and prosperity throughout the world.

I have also been deeply impressed by your great architectural works, both ancient and modern, and by the great beauty and splendour, and high artistic quality of your musical and dramatic performances. These I have very greatly appreciated and enjoyed.

In conclusion, I wish to thank the Academy for the privilege of a visit to the U. S. S. R., and to express my confident belief in the great future which lies before the science and culture of the U. S. S. R.

Very sincerely yours,

F. G. Donnan

Professor of Chemistry,
University of London

IT IS WITH feelings of great gratitude to the Soviet Government and the Academy of Sciences of the U. S. S. R. that I leave Russia. The celebrations of the 220th anniversary

of the foundation of the Academy have been truly magnificent and the meetings with Russian scientists of great interest and importance. It has been an unforgettable experience. The warmth of your reception and the full discussion of scientific problems of mutual interest has impressed me very much. In a few words I cannot do justice to the very fine scientific work I have seen in Moscow and Leningrad. It is clearly the product of a social organisation in which science is highly valued for its own sake and also for the good it can bring to mankind. The rate of progress is very important and I think great developments in Russian science will be seen in the next few years. Finally, it is my earnest hope that the cooperation between scientists in our two countries which has been so auspiciously renewed will continue and increase after we have returned to our own country.

W. A. Wooster

Professor of Crystallography,
Cambridge University

I WAS invited to the U. S. S. R. for the 220th anniversary session of the Academy of Sciences but unfortunately arrived too late to participate in the main proceedings. I was in time only for the concluding meetings and much to my regret missed the opportunity of making closer contacts with many scientists and of hearing the very interesting reports made at the session.

My late arrival, however, gave me an advantage over the guests from other countries in that I was able to remain longer than most after the conclusion of the anniversary celebrations. I had the opportunity to travel to Stalingrad and Tashkent, visit a number of factories, agricultural research institutions and collective farms and to become convinced at first hand how science is applied to the national economy of the Soviet Union. The close relations between Soviet science and scientists and the life of the people has become clearer than ever to me.

It is common knowledge that Soviet science is very highly developed. I heard the opinion expressed by a number of English and American scientists attending the anniversary session that many branches of science in the U. S. S. R. are on a higher level of development than in England or America. It must be re-



The French Scientist Jacques Nicolle Shows Drs. A. Abrikosov and N. Gamaleya, Members of the U. S. S. R. Academy of Sciences, the Pasteur Preparation Which He Presented to the Mechnikov Institute in Moscow

membered, however, that unless a highly developed science is closely connected with the life of the people and unless its development is all embracing, it brings more harm than benefit to the people. Germany and Japan are examples of countries where this sort of abnormal development prevailed and the recent war has fully revealed the evil of such a system. These two countries not only brought harm to their own peoples but to the whole of mankind. The path followed by the Soviet Union is exactly the opposite of theirs. In the U. S. S. R. science, engineering and the national economy comprise a single whole and it is now clear that this is the only correct path for the development of human civilisation, the path which all mankind should follow.

It seems to me that all Soviet scientists are consciously doing their work in a spirit of self-sacrifice. We who see this from the outside experience a tremendous feeling of joy at the knowledge. It is tantamount to boarding a train standing under full steam and then racing ahead at top speed toward a definite destination. Life in the Soviet Union is secure, work is guaranteed and there is every promise

that success is just as sure. Such a situation is deserving of our admiration and even envy.

As far as my own work is concerned, it has been devoted to the study of history. I have specialised in Chinese history, particularly that of the ancient epoch. Most contemporary Chinese historians are inclined to concentrate their attention on the study of ancient society, where they are limited by the social background of a single society. The history of modern China is more difficult to comprehend. When one begins to speak of present-day China, he is confronted with the complex situation existing today and for that reason historians are turning more and more to the past. This is, unquestionably, a departure from the right path.

Soviet historians pay considerable attention to Chinese history and particularly to the modern period. The profound study of history in the U. S. S. R. calls forth my deepest admiration. Many of the young scientists with whom I became acquainted are enthusiastically studying the history, economics, diplomacy and culture of China during the past century. They are all collecting material on the subject,

desirous of working out a definite system. There can be no doubt that both in efforts and achievements Soviet research workers have gone further than Chinese historians.

Realisation of this fact set me to thinking very seriously. If the study of history is always to be confined to the problems of ancient society it will certainly come to an impasse, avoiding reality and severing all ties with the life of the people.

I am very grateful for the opportunity to have visited the Soviet Union. My stay in the U. S. S. R. gave me much that was useful, first in understanding the direction of the whole future upbuilding of the country and second in determining the path of my own work in science. Indeed, my journey was not in vain. When I return to China I shall relate all that I have seen and heard to the Chinese people and Chinese scientists. I am sure that they, like me, will be roused to admiration by the truth about your country.

Kuo Mo-jo

MY VISITS to various scientific institutes engaged in the study of soil science and its application to agriculture were a source of great pleasure. Everywhere I met highly specialised workers in this field whose activities proceeded under the guidance of outstanding scientists.

At the Dokuchayev Institute the associates of Academician Prasolov are continuing their work on compiling a soil map of the world and are perfecting modern soil science. At the Timiryasev Institute Academician Pryanishnikov is continuing the researches in agricultural chemistry which have brought him so much fame. New problems which are of considerable scientific and practical interest are being studied. I also visited various laboratories in Moscow and Leningrad where I found the same enthusiastic interest in science. I am impressed by the significance of the contribution being made by our Soviet colleagues to the development of scientific knowledge. This contribution will undoubtedly continue to promote agricultural science, the main source of man's prosperity.

A. Demolon

Inspector General of Agronomic Research
Laboratories and Stations

AMONG the reports made at the 220th Anniversary Session of the U. S. S. R. Academy of Sciences I was especially interested in Delaunay's report on the history of mathematics in the U. S. S. R. (the school of Chebyshev and his pupils in Leningrad and the school of Bernstein, Alexandrov, Kholmogorov, Krylov and others in Moscow) and also in Academician Vinogradov's report about the important discoveries which he and his pupils have recently made in the theory of numbers.

I was also impressed by the report on the new linguistic method worked out by the Marr school.

It is gratifying that a French translation of this report is available.

In general, the relations between French and Russian mathematicians have always been friendly and cordial. Many French scientists attended Russian congresses and Russian scientists were likewise frequently invited to Paris to read papers on their researches.

It is most desirous that these relations between Soviet and French mathematicians be strengthened and that the exchange of literature be increased.

Allow me to add, in conclusion, that I carry away with me the most pleasant memories of my visit to the Soviet Union, the country which has done so much for the liberation of the whole civilised world, the country whose greatness arouses the admiration of each and all of us.

E. Cartan

Member of the Institute of France
and Honorary Member of the Moscow
Mathematical society

I WAS particularly impressed by the close connection existing between the Russian botanical institutes engaged in pure scientific work—such as the Komarov Institute in Leningrad whose splendid library and collections of plants I visited—and the institutes engaged in applied science, i. e. those dealing with agriculture, plant cultivation, utilisation of wild plants, etc.

Those sciences whose application aims to further human progress must be considered the highest forms of science.

It is my earnest desire that broad contacts be established between the institutes in Russia and similar institutes in France, that students of both countries meet each other and

that a regular exchange of scientific literature be effected.

I take this opportunity to express my deep appreciation to Russia for the cordial welcome extended to me.

Long live the Soviet Republics and the great organiser of the victories of democratic civilisation—Marshal Stalin!

August Chevalier

Member of the Paris Academy of Sciences
(Department of Botany)

THIS VISIT to the U. S. S. R. has given me the impression of a mighty country whose people are happy and proud of their victories, and who are patriotically and enthusiastically working to repair the ravages of war and increase the power of the U. S. S. R.

As a geophysicist I was particularly interested in the scientific work in geophysics connected with natural deposits and their exploration and study, fields in which the Soviet Union can point to substantial achievements. My admiration was also aroused by the work done in the Polar Seas both for the development of navigation and for the study of geophysics and meteorology in these regions.

It is my wish that through an exchange of literature as well as of visits by scientists we shall strengthen the ties existing between our two countries.

Charles Maurain

Member of the French Academy of Sciences,
Corresponding Member of the U. S. S. R.
Academy of Sciences

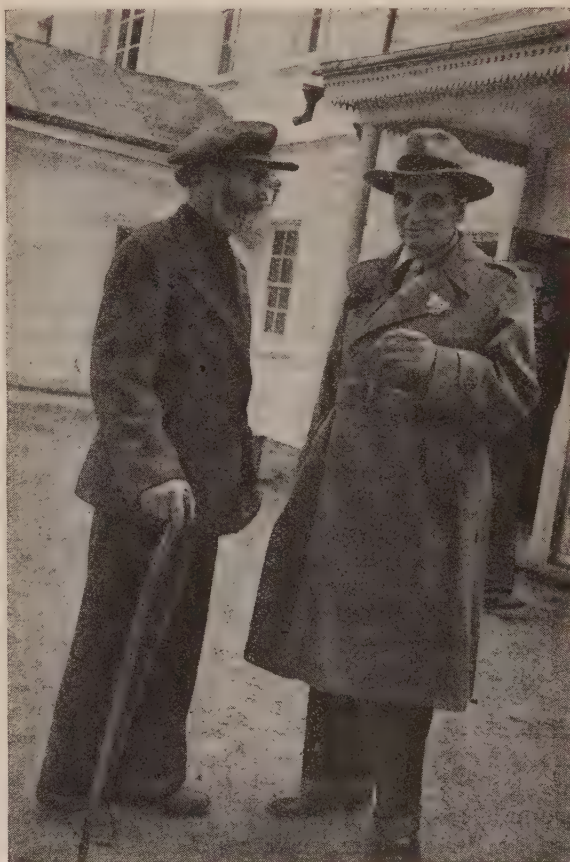
THE 220TH ANNIVERSARY of the Academy of Sciences must be regarded throughout not only the scientific world but also the world generally as a magnificent, bold, and statesmanlike undertaking in the interests of rehabilitation. No approach can be more hopeful or promising than the scientific approach, and this the Academy of Sciences has emphasized to the scientists of all countries. The Academy of Sciences has made its great contribution to science in war and it is a high tribute to the statesmanship of its directors that it should seize the moment of success immediately to emphasize the great possibilities and contributions of science in peace. By the celebration of this anniversary at this time it has demonstrated its recogni-

tion and support of the fundamental position of science in the restoration of world order and peace.

Harold Innis

University of Toronto, Department of
Political Economy

AS A PHYTOGEOGRAPHER who in his youth studied the flora of Russia and particularly the flora of the Caucasus I was very glad to meet some of my old acquaintances in the field of botany, especially the venerable V. Komarov, and to renew my contacts with outstanding Russian botanists. My visits to the botanical institutes in Moscow and Leningrad enabled me to gain much new information about the achievements of Soviet science and the new publications in this field. I deeply appreciate the cordial welcome ex-



*Prof. von Karman of America Talks With the Former
Coachman of Leo Tolstoy at Yasnaya Polyana*

tended me by Russian botanists. I was presented with many books and was promised that arrangements would be made for further exchange of literature and plant collections.

As director of the Botanical Institute and Gardens in Warsaw, now destroyed by the Germans, I am very grateful for the support of my Russian colleagues in the work of reconstruction. It is my sincere hope that we shall continue to maintain contact with Russian botanists in the future.

Prof. Boleslaw Hryniewiecky

Director of the Botanical Gardens,
Warsaw

MY GENERAL impression of Russian science gained during this visit to Moscow and Leningrad is a very good one. The Academy of Sciences is very efficiently organised and its research institutes, as well as those connected with universities, are not only making substantial progress in research but are also training new scientific workers to ensure the further development of Russian science.

Since my particular field is Slavonic history and literature I was primarily interested in Soviet research in this field. I visited the Research Institutes of the Russian Language directed by Academicians Meschaninov and Obnorsky and the Institute of the Russian Language in Leningrad directed by Prof. V. Chernyshov. I also made the acquaintance of many Soviet linguists—E. Istrin, Vinogradov, Barkhudarov, Bubnikh and S. Bulakhovsky of the Ukrainian Academy of Sciences whose works I have long known and with whom I have corresponded.

I am sorry that I was unable to meet Derzhavin whom I know from pre-war meetings, and who is now abroad.

During the talks I had with my Russian colleagues we discussed many questions of a practical as well as a theoretical nature. We spoke of the exchange of literature and agreed on the urgent necessity of a permanent exchange of professors and students in Slavic countries. Such a practice would do much to promote an understanding of research methods and to further our knowledge of the various Slavic languages, without which difficulties are bound to occur in the normal development of research in Slavic culture.

It must be borne in mind that all the Slavic countries suffered heavy losses during the war both in research and in research workers. Close cooperation between these countries today is a prime factor in restoring the losses we have suffered and in ensuring the further development of Slavic studies.

T. Splavinsky

Rector of the Jagellonian University
Cracow, Poland

RUSSIAN science is already of the greatest importance, and it is moreover in a state of enormous development. But the U. S. S. R. as well as the whole world must have as intimate scientific relations as possible, not only through an exchange of printed literature but also of the scientists themselves, especially young ones. The papers read at the Anniversary Sessions have been of great value. I have the best impressions of my meetings with the Academy members, especially those connected with the Arctic Institute and the Central Geophysical Institute of Leningrad.

Hans W. Ahlmann

Professor of the Stockholm University
Sweden

ABOUT ten years ago I had the opportunity to visit the U. S. S. R. on the occasion of the Mendeleyev Jubilee. I made contacts with several of my colleagues in chemistry and physics and saw a number of scientific institutions both in Leningrad and Moscow. The effort that was being made to develop scientific research on a large scale impressed me very much.

On my return to Russia now as a guest of the Academy of Sciences of the U. S. S. R. I have renewed acquaintance with my colleagues and made new friends and revisited institutions and laboratories. In my opinion very great progress has been made. The laboratories have been enlarged and a huge amount of knowledge has been accumulated. During the time between my two visits to the U.S.S.R. I have kept in touch with my friends here, except during the war when postal communications were interrupted. I have now learnt how much has been done in these last

years in spite of the difficulties caused by the war and I admire greatly the spirit that has kept research proceeding under such trying conditions. Among the institutions I have visited I am especially impressed by the Institute for Physical Problems in Moscow (director: Professor Kapitza), the institute of Colloid Chemistry and Electrochemistry in Moscow (director: Professor Frumkin), the institute of Chemical Physics in Moscow (director: Professor Semenov) and the Physico-Technical Institute in Leningrad (director: Professor Joffe).

In my opinion the best way to further the development of scientific relations between the U. S. S. R. and my country (Sweden) would be to facilitate the exchange of books and periodicals and also to try to arrange an exchange of students and scientific researchmen between laboratories in the two countries. During the daily work in a laboratory people learn to know each other in a better way than during short occasional visits. This makes for mutual understanding and appreciation of different points of view.

Theodor Svedberg

Professor of Physical Chemistry,
Institute of Upsala

MY VISIT to the Soviet Union at the invitation of the U. S. S. R. Academy of Sciences will always remain as one of the most memorable and vivid recollections in my life. It was particularly pleasant to meet eminent Russian Roentgenologists and crystallographers whose work I have studied with the keenest interest and with whom I have corresponded and exchanged publications for the past twenty years.

The discussions and exchanges of opinion on research work were exceedingly valuable and it will be a source of great satisfaction to me to inform my pupils and associates in Sweden of all the achievements and new developments which I witnessed in the Soviet Union. I was tremendously impressed by scientific activities in the U. S. S. R.

One of the things that most aroused my admiration was the remarkable research work conducted under the trying conditions of wartime, research which achieved such astounding success in so many different branches of science.

It is to be most desired that in future the results of such research be published in English and French as well as in Russian.

In the meantime I shall urge students and young scientists in my country to study the Russian language. Cooperation between our two countries would be greatly advanced if Swedish scientists were to visit the Soviet Union to study and participate in research work there and if Soviet scientists were to visit Sweden and become acquainted with achievements made in their particular fields in our country. We would greatly welcome such visits and I can assure you that everything would be done to enable our guests to enjoy their stay in Sweden.

Professor Arno Wastgren

Secretary of the Royal Swedish Academy
of Sciences

DESPITE the fact that my visit was a very short one and I was unable to see as much as I would have liked to, I was very glad of the opportunity to visit the museums, research institutes and libraries of Moscow and Leningrad. My visits to these places were very interesting and a source of deep satisfaction.

Even before I left for the Soviet Union I had heard much about the progress made by the people of the Soviet Union in social life. What I saw on my arrival only served to convince me still further. I must admit in all frankness that the Soviet people owe this progress to the efforts of outstanding Soviet scientists who are doing everything possible for the widespread application of scientific and cultural achievements throughout the country. The seeds sown by these benefactors of humanity have borne a harvest so bountiful that it has attracted the attention of the whole civilised world.

The best thing that the vast Soviet land has produced is the valorous Red Army, founded at the initiative of such a mighty and energetic leader as Marshal Stalin, an army which won the decisive victory over fascism, the enemy of all mankind.

The research institutes of the U. S. S. R. Academy of Sciences are also the fruits of the labour expended by Soviet scientists. There is no doubt that V. O. K. S. plays a predominant

role in establishing cultural relations between the U.S.S.R. and the intellectual circles of other countries. Its work in this field cannot be overestimated.

Hussein Samii

President of the Iranian Academy

AS ALL OTHER foreign delegates, I also am deeply impressed by the boundless hospitality, the quality and quantity of scientific research carried out in the U. S. S. R., the generosity with which the state supports science and the wonderful organisation of the Academy's work and its research.

I can judge the value of the results only in my subject, biochemistry, but I am really justified to state my opinion only about the work done in my special field of research: the chemistry and mechanism of muscular contraction. I daresay that this field of work has been opened by the two discoveries of two Russian researchers, one of them being M. N. Lyubimova and the other V. A. Engelhardt, who, in close collaboration, discovered most remarkable physical changes in the contractible substance of muscle and also discovered the enzymic nature of this contractible substance.

For the future development of science in U. S. S. R. and its closer collaboration with other parts of the world I think it most desirable that the main research-results, and the most important papers should be published also in some foreign language. I also hope that the U. S. S. R. will not release the lead in organising world-science and in general world-cultural relations, the lead it has taken by inviting us foreigners to its 220th Academy Anniversary.

Albert Szent Gyorgy

Professor of biochemistry,
University of Budapest,
Nobel Prize Winner

THE FINNISH Delegation, which has had the honour and pleasure to participate in the celebrations held by the Academy of Sciences of the Soviet Union, has been in a special position in that most of its members were representatives of jurisprudent and economic sciences. Since most of the meetings were devoted to the natural sciences, we had less opportunity than other delegates to meet scientists of our own profession from various countries. On the other hand it may be considered natural that the exchange between various countries of economic information and statistics cannot be arranged during the war to the same extent as during times of peace. In spite of that, we got a clear idea of the fundamental work being done by the Academy of Sciences to develop the sciences of jurisprudence and national economy. At the same time, personal meetings with representatives of the same profession have strengthened our confidence that in the future the exchange of information and results of scientific research can be performed in a manner which will be of great assistance to scientific activities.

The anniversary of the Academy of Sciences was not only a festival of scientific work but also a great opportunity to become acquainted with the Soviet Union during the days of the victorious ending of the great patriotic war.

This acquaintance has left a lasting impression. Unforgettable are also those occasions on which we had the opportunity to become acquainted with the powerful and effective art of the Soviet Union.

In expressing gratitude for this splendid holiday, the Finnish Delegation wishes to mention the great friendliness and helpfulness, which are shown to a traveller everywhere in this country, even on the part of the general public.

Eric Idestam

Arvo Sipilä

Carl Erik Knoellinger

R. Tuhti

STRATEGIC OBJECTIVE

By Major-General M. Galaktionov

Chapter Two¹

CENTRE OF GRAVITY

Stalingrad—The centre of gravity of the Struggle

AS WE HAVE already said, in the middle of July 1942, a powerful German grouping consisting of the 6th and 4th tank armies launched an offensive against Stalingrad from the region of Millerovo. The plan of the Hitlerite Command was to capture Stalingrad in their stride. According to their calculations they were to reach the city by the 25th July. True, the Germans had already exceeded their time limit, for by its valiant defence of Voronezh the Red Army had caused revisions in their plans. From Millerovo to Stalingrad extended a distance of about 300 kilometres, but the German Command assumed that it would not meet with any serious resistance on the way. The 6th army was to proceed due east to the great bend of the Don, while the 4th tank army was to out-flank Stalingrad on the southwest. The 8th army, consisting chiefly of Italian formations, was to cover the Germans on the north.

Thus, in the middle of July, the German Command already headed its troops towards Stalingrad. It realized that, as shown above, this city had a tremendous strategic significance. This would seem to explain the fact that as the campaign of 1942 progressed, Stalingrad became the centre of gravity of all the military operations conducted on the whole front. Indeed, had the Germans not advanced upon Stalingrad, this city would never have come to be such a centre of gravity.

This makes it appear that the German Command chose Stalingrad as its objective and systematically strove to reach it. We must, however, caution our readers against so

simple a deduction. Stalingrad really came to be the centre of gravity of the struggle waged over a whole front despite the plans of the German Command, and it was this that marked the beginning of Germany's strategic defeat.

The expression: "to shift the centre of gravity of operations to some particular direction" serves to designate the main direction of a blow. The strategic objective likewise designates the main direction of a blow, but although in certain cases the meaning of these terms may coincide, essentially they differ.

Our concept of the centre of gravity is of a point between the "strategic objective of the offensive operations" and the "strategic objective of the defensive side."

A centre of gravity in relation to the whole front may arise even when no strategic objective is set. It may arise from battles begun on some sector with merely a tactical goal. In the attritional period of World War I such hard-fought engagements occurred in Flanders and in Champagne and lasted for months, being fought with tremendous stubbornness and intensity. Only immediate goals and not decisive ones were pursued in these engagements.

If the attacking side sets a strategic, i. e., decisive, objective and attains it without serious resistance on the part of its foe, the concept of a centre of gravity is virtually unnecessary: the main direction of the blow is determined by the strategic objective. This concept is required in connection with the operations of the defensive side. Battles, after all, arise as the result of the clash of two sides.

When stubborn defensive operations are conducted the attacking side may be checked before attaining its objective and then the

¹ Continued from V.O.K.S. Bulletin Nos. 5 and 6, 1945.

centre of gravity of the struggle arises in this area: the attacking side strives to attain its objective, the defensive side counteracts. The centre of gravity may be shifted to another direction either because the attacking side adopts a new decision or because the defensive side launches a counter-attack on another sector.

The strategic objective is set by only *one* of the sides, but the centre of gravity of the battles waged along the whole front arises as a result of the activities of *both* sides, the attacking and the defending.

Let us now consider the facts. They must be established very accurately if we wish to understand what happened at Stalingrad.

At the time when the German grouping began its advance upon Stalingrad the centre of gravity of the engagement was located in Voronezh. All through July bitter battles were fought here. Was it mere chance that Voronezh came to be the centre of gravity of these battles? No. The Germans were driving towards Moscow—their main objective. But the Red Army blocked their path like a steel wall. Here, consequently, the will of the Soviet Command made itself manifest and influenced the situation.

In view of the enormous numerical superiority of the enemy in the South, the Red Army was naturally in the position of the defending side. The Germans had to be checked at all costs. But we already know how difficult a task this is when a breakthrough has been made, when the enemy's mobile forces are rapidly advancing into the interior. Only by the Stalinist method of directing of operations in 1941 were the means of accomplishing this task under the conditions obtaining in modern warfare first found. The defensive side must have a definite strategic plan dominated by a lucid strategic objective when launching a counter-attack.

In July 1942 the Soviet Command was faced with the need of making an exceptionally important decision. The situation was ominous. To scatter its reserves over a huge area—which is what the Hitlerites aimed at—would have meant to allow the most powerful instrument for influencing the situation that a supreme command has at its disposal to slip out of its hands. The Soviet Command employed only part of its reserves, acting in accordance with its strategic plan. It immediately saw through the enemy plan, the main

objective of which was Moscow. As their first and most important task it required that Soviet troops prevent the enemy forces from reaching the northern bank of the Don, they check them along the shortest routes to Moscow. The troops of the Voronezh front valiantly carried out this task. That is how Voronezh came to become centre of gravity of these battles.

The Soviet defensive front began to establish itself along the Don from Voronezh to the southeast and to grow daily stronger. This entailed strategical defeat for the Germans, despite all their tactical gains in the South. Of course, the Hitlerite Command understood this and made repeated, but unsuccessful, attempts to break through to the north across the Don in the vicinity of Boguchar and subsequently in the vicinity of Kletskeya. But it was precisely at these points that it met with the most stubborn and active resistance on the part of the Soviet Command. The Red Army not only kept the Germans from reaching the northern bank of the Don, but also retained a number of place d'armes on the southern bank.

Further to the south, however, the initiative was wholly in the hands of the German Command. The Germans took Rostov towards the end of July. Continuing their rapid advance to the southeast, they reached Mozdok by the end of August.

On what particular directions did the German troops concentrate their main efforts at the time when one of their groups was given the goal of taking Stalingrad and when this group was already actually advancing upon Stalingrad?

A communique of the Soviet Information Bureau summarizing *Three Months of Fighting on the Soviet-German Front* (from the 15th May to the 15th August) stated:

"Despite the fact that the enemy threw all his main reserves of man power and a tremendous quantity of material into battle, the German offensive developed only on the Voronezh and Southern directions and even there at a much slower rate than during the first period of the war. It is sufficient to say that the Germans have been marking time on the Voronezh sector for all of a month and a half and that of late Soviet troops have taken the initiative into their own hands in some places on this sector of the front. In the great bend of the Don the Red Army has been beat-

ing back the frantic attacks of the Nazi troops for several weeks and is destroying the enemy's man power and material."

Thus, in July-August 1942 it was by no means possible to say that the German Command considered the Stalingrad direction its main direction. This is obvious now that we know what strategic objectives the German Command did pursue. But this did not mean that it did not appreciate the strategic significance of Stalingrad. After all, it was with good reason that it had organized a powerful grouping to effect its capture.

Notwithstanding their failure at Voronezh, the Germans were obliged to capture Stalingrad so as to consummate and ensure their successes in the South. But the German Command by no means abandoned its main objective—the capture of Moscow. Inasmuch as the Germans had failed to break directly across the Don to the north they planned to force the Don at its bend. Their breakthrough in the south ensured the success of this operation, for the Soviet defence was weaker in the south. This, in part, accounted for the task set the 4th tank army—to outflank Stalingrad on the southwest. After emerging on the Stalingrad place d'armes the Germans planned to turn north, advancing along the Volga to outflank Moscow.

Regarding Stalingrad as an intermediate objective, but one important for the fulfilment of the strategic plan of their campaign, the German Command detailed a large enough force for its attainment: more than fifteen infantry, four tank and four motorized divisions. These were well-organized and experienced fighting formations, thoroughly equipped, having several hundred tanks and supported by a powerful force of aircraft.

This grouping advanced through a breach where at first there was no organized defence. The Red Army was waging bitter battle at Voronezh, for its most important task was to prevent the Germans from crossing the Don. The defence of Stalingrad would have been left hanging in mid-air, had it not had contact with a new defensive front which at that time was still only in the process of formation on the eastern bank of the Don. Transport conditions, which retarded the rapid transfer of reserves to the vicinity of Stalingrad, also played an important role.

For this reason our defence in the bend of the Don was inevitably weaker at first than

the pressure exerted by the attacking forces. It was still of an improvised nature. In the very fire of battle the valiant 62nd army and other army formations became steeled and well-organized. Under the difficult conditions then prevailing they had need of reinforcements of men and materiel as well as of the proper organization of supplies. In the south the Germans pressed deeper into the interior, outflanking the Soviet troops defending Stalingrad.

The German Command had every reason to assume that it would not meet with any serious resistance on the road to Stalingrad and would be able to capture the city in the course of two weeks. The strength of their grouping was determined not so much by the task of capturing Stalingrad as by the intention of following up its capture with a further development of their offensive northward.

However, here again the Germans overestimated their own strength and underestimated the strength of their enemy. Intoxicated with their tactical gains, they failed to give full credit to the heroism and strength of the Red Army's resistance, the might of our state, its human and material resources, and finally, paid no heed at all to the fact that their plans might be counteracted by the correct and far-sighted strategical plan of the Soviet Command.

As events on the Stalingrad direction developed, the profound and penetrating evaluation of the situation by the Supreme High Command of the Red Army assumed ever greater significance.

Stalin pointed out their most important tasks to Soviet troops: to defend Stalingrad at all costs. One of the directives of the Supreme Command, issued in the beginning of August, said that "the defence of Stalingrad and the rout of the enemy advancing upon Stalingrad from the west and the south, is of decisive significance for the whole of our Soviet front."

Only now can we appreciate the full wisdom and significance of these words. Stalin does not merely attach importance to the defence of Stalingrad as an object of great strategical significance. He speaks of "the decisive significance for the whole of our Soviet front" of both the defence of Stalingrad and "the rout of the enemy" in the vicinity of Stalingrad.

It is amazing to see how clearly the strategical goal that was later set the troops in the

operations for encircling and routing the German grouping at Stalingrad was indicated in this defensive phase of the campaign. At that time, i. e., in the beginning of August, Stalin already foresaw the decisive significance that the rout of the Germans at Stalingrad would have for the outcome of the whole campaign.

When we discussed the campaign of 1941 in the first chapter we spoke of the three phases of strategic defence. In the first phase of the campaign of 1942 the Soviet Command saw through German plans and counteracted them. In this phase the principal efforts of the defence were concentrated not on Stalingrad but on Voronezh, with the purpose of preventing the Germans from achieving their main objective—breaking through to Moscow. At the same time a defensive front was built up along the Don, this being an important pre-requisite for the defence of Stalingrad and for checking the enemy offensive towards the south. Measures were also taken to create a defensive front firstly on the Stalingrad direction and then further to the south as well.

The second phase began when it became evident that a large enemy grouping was advancing upon Stalingrad. Was it possible, before that, to say that this was where the centre of gravity of the struggle would arise? No, it was not. True, logic indicated that the Germans should make a drive against Stalingrad. But in war one cannot wholly depend upon the enemy's making logical conclusions. The Germans might very well have found reasons for not advancing upon Stalingrad at that time. Only when it became apparent that a large German grouping was advancing upon Stalingrad did the situation on the whole front also begin to grow clear.

Indeed, it now became possible to judge what principal directions the blow of the German forces would take and how they would be distributed over the front. However we saw in the first chapter that even in the second phase it is a matter of the most skilful generalship for the defending side to set itself a strategic objective. In July and August the Germans continued to follow up their tactical gains in the south. It was by no means precluded that they might attempt new blows on the northern direction, too—for instance, in the region of Orel.

When they began their advance upon Stalingrad the Germans were far from thinking that

this city would become the centre of gravity of the struggle waged on the whole front. They believed that they would take Stalingrad in short order. Certainly their advance far into the south and their marked superiority of forces on the Stalingrad direction were greatly to their advantage.

As early as the beginning of August Stalin pointed out the decisive significance that the battles for Stalingrad had for the whole front. He thereby gave a lucid estimation of the situation and showed wise insight into the further development of the colossal struggle. In addition, however, this was also the bold decision of a military leader who exercises an active influence upon the situation.

The initiative was in the hands of the Germans. Considering the vast scale on which the struggle was being waged it was extremely difficult for the defending side to ensure a planned nature for military operations. The objectives of the enemy had to be discovered and the development of events foreseen. The defending side's strategic plan of the campaign is built up on these factors.

The first link of this plan was the decision to repel the enemy's attempts to advance to the north. In the following stages of the struggle the task of keeping the Germans out of Moscow still remained the most important one. This task was carried out.

But even so, the German breakthrough to the south was fraught with danger for us. The Germans had to be checked there, too, which meant that the German advance on Stalingrad had to be repelled. By retaining Stalingrad we could actively influence the course of the struggle further to the south. The loss of Stalingrad would mean the severance of the North from the South.

The enemy had already pitted large forces against Stalingrad. The defending side's decision to defend Stalingrad at all costs inevitably led to a bitter struggle on this sector of the front.

Stalin had planned the rout of the Stalingrad grouping of the Germans way back at the beginning of August. Naturally, the plan of the operation which was subsequently carried out at Stalingrad did not yet exist at that time. The moment when the troops could be told the strategic objective of their offensive operations had not yet come. But this objective was already foreseen by the Supreme Command in the second phase of the defence.

It was not because it accorded with the plans of the German Command that Stalingrad came to be the centre of gravity of the struggle. This came to pass because the defending side counteracted the German plans. This marked the beginning of the struggle for the initiative.

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The German Command originally planned to capture Stalingrad in its stride by means of a direct blow to the east across the bend of the Don. It evidently did not expect to meet with any serious resistance. Disillusionment, however, came soon enough. Our troops on the Kletskaya Surovikino-Suvorovsky front blocked the enemy's path. Fierce battles broke out on the western bank of the Don. Making extensive use of their tanks, the Germans resorted to their usual tactics of trying to drive a wedge into our front and encircling our troops in separate groups. The Soviet Command, however, counteracted the enemy's schemes by means of stubborn defence and counter-attacks. The Germans failed to break across to the left bank of the Don.

On the southern sector, on the other hand, the enemy was successful. At the end of July the 4th German tank army forced the Don at Tsymlyanskaya and began to advance upon Stalingrad along the Tikhoretskaya-Stalingrad railway line. Here, too, however the Germans failed to reach Stalingrad in one jump. After bitter fighting they were checked at the station of Abganerovo. In these battles nearly a hundred German tanks were destroyed. Even at this stage of the engagement the enemy suffered appreciable losses, and every additional step forward cost the blood of many German soldiers. This was not at all the pleasant promenade the Hitlerite Command had pictured to itself. Our failure on the southern sector, however, affected the situation at the bend of the Don. In the middle of August, after exceptionally hard fighting,—our troops retreated to the left bank of the Don.

The unexpected protraction of what they had planned as a lightning march on Stalingrad was not to the liking of the Hitlerites. They gathered together a powerful grouping and forced the Don in the regions of Vertyachi and Peskovatka. The heroic men of the 62nd army valiantly resisted the onslaught of the enemy's numerically superior forces, but in

the course of the bitter battles fought during the second half of August the Germans succeeded in following up their gains and breaking through to the Volga on the Erzovka-Rynok sector, north of Stalingrad. In order to wipe out the grouping that broke through, our troops launched a series of counter-attacks from the north and the south, which, although they localized the breakthrough, failed to expel the Germans.

Simultaneously the enemy advanced upon Stalingrad from two other directions, from the vicinity of Kalach in the west and the vicinity of Plodovity in the south. Our troops stubbornly defended every metre of ground at the approaches to Stalingrad. The enemy, however, had a great superiority of man power and materiel. Towards the middle of September, after fighting desperately every inch of the way, our troops took up the best available positions for direct defence on a line from two to ten kilometres from the outskirts of the city. This front, which was about fifty kilometres long, ran north of Rynok and Orlovka, formed a salient west of Orlovka, crossed the Millerovo-Stalingrad railway line at the side station of Razgulayevka and ended up on the bank of the Volga at Elshanka and Kuporosnoye.

What were the results of the last two months of fighting? The principal result was that the fighting for Stalingrad had been going on for all of two months and still the Germans had not taken the city. Their plan to take Stalingrad by means of a lightning blow had fallen through. The Germans' Stalingrad grouping found itself involved in an engagement that was steadily growing fiercer. At that time the Hitlerite Command did not yet realize how fatal this fact was. The Germans were still rejoicing in temporary gains.

Judging superficially, the two months of fighting at the approaches to Stalingrad had brought us only unfavourable results. Actually our heroes had not shed their blood on the banks of the Don in vain. Precious time—two months had been gained and utilized for strengthening the Soviet defence. In the course of these battles a passion for vengeance had been kindled among our fighters, their will had been steeled and they had gained experience and efficiency in fighting the enemy. The nearer the fighting came to Stalingrad the more stubborn became the resistance put up by our troops.

The Germans broke through to the Volga north of Stalingrad. This was an effective moment for Hitlerite communiqués. Of course, the seriousness of the blow inflicted upon the Soviet defence cannot be denied. The enemy had reached the Volga! What Russian heart did not contract painfully at the news that the Germans were on the banks of the river which meant so much to the life of our people! This news spoke of the scale of the enemy's territorial gains and of the severance of important lines of communication linking us with the South. The sober language of facts, however, indicated that even in these days that were so sad for us the enemy patently overestimated the importance of its successes.

The wedge driven north of Stalingrad was like the wedge towards Schlussemburg east of Leningrad. And just as this tactical wedge towards Schlussemburg was not a strategic wedge severing the North from the Centre, so the wedge north of Stalingrad had only a tactical significance. We have already pointed out that if the Germans had succeeded in capturing the Stalingrad place d'armes they would have been able to breach the front and obtain a base for further operations. But to do this they first had to take Stalingrad and enlarge the place d'armes so as to bisect the Soviet front along the lower reaches of the Volga. Instead of that all the Germans were able to do was to drive in a narrow tactical wedge without taking Stalingrad.

An important factor in the situation that arose was the creation of a stable front of Soviet defence on the northern side of the breach. It ran from Voronezh along the eastern bank of the Don and at Rakitino turned towards the Volga near Erzovka. The troops of the Stalingrad front were stationed on this sector north of Stalingrad. They not only blocked the Germans' path to the north but also struck out against the Germans' Stalingrad grouping, holding several place d'armes on the western bank of the Don and thus covering the Stalingrad grouping from the North. The Hitlerite Command put Italian and Rumanian troops forward on this sector, but what did this signify if not the demise of the German main strategic plan of flanking Moscow? The roads to the Soviet capital were firmly blocked to them by the middle of September.

Stalingrad was defended by the 62nd army,

which formed part of the Southeastern front. This front formed a connecting link with the troops of the Caucasian front. In the North Caucasus our defence steadily grew stronger building up a fortified barrier to Baku and the Transcaucasus.

Thus, by the middle of September the Germans' main strategic plan had been patently thwarted by the growing strength of the Soviet defence. This is obvious now, but at that time, the German Command, dazzled by its gains, did not see this and did not want to see it. It thought that by striking a series of new blows it would be able to crush the still unstable Soviet defence in the vicinity of the breach and lay a path towards its strategic objectives. This invested Stalingrad with all the more importance. It was in just this area that the Hitlerites planned to sunder the newly formed Soviet defence front. They thought it would be an easy task. It seemed to them that after their successful advance to Stalingrad the actual seizure of the city would not present any particular difficulties.

Thus lightmindedly did the German army involve itself in an engagement that sealed the fate of Hitlerite Germany.

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On the morning of the 13th September the Germans launched a general assault on the southern and central parts of Stalingrad with a force consisting of three infantry, two tank and one motorized division. In the bitter fighting that lasted all through the second half of September they succeeded in capturing the southern part of the city and the eastern districts of the central part. But in the centre of the city, on a sector north of the river Tsaritsa and east of the railway line up to the Krutoi and Dolgy ravines, the Soviet soldiers stood fast and never once let the enemy through to the Volga.

The enemy wore itself out in fruitless efforts and finally transferred its fury to the northern sector of the battle field. It succeeded in taking Mamayev Mound, the tactical key to the field of battle. German tanks poured into the *Red October*, *Barricades* and *Orlovka* settlements, although the heroes of Stalingrad defended them inch by inch. Making use of its tremendous superiority in tanks, aircraft and man power, the enemy took these settlements early in October. The defenders of

Stalingrad were pressed back onto a narrow strip of land along the Volga. The Germans filled the ether with triumphant communiqués about the fall of the “impregnable Bolshevik stronghold on the Volga.”

It was then that there came the famous order from Stalin, the leader of the Stalingrad defence.

“I demand,” he wrote in his telegram to the commander of the front, “that you take every measure to defend Stalingrad. . . . Stalingrad must not be surrendered to the enemy, and that part of Stalingrad which has already been captured must be liberated.”

The hearts of the soldiers of Stalingrad were fired with the sacred flame of hatred for the enemy and love for their native land.

An epic battle began in the shops of some of the first factories to be built under the Stalin Five-Year Plans—the Stalingrad Tractor Plant, the *Barricade* and *Red October* works. This was very symbolic. The Soviet land, the land of victorious socialism, was fighting the dark forces of German fascism. And this battle was won by the heroic defenders of the city of Stalin. Towards the middle of October, at the price of torrents of blood, the Germans captured the Stalingrad Tractor Plant. They then proceeded to storm the *Barricade* Works with frantic energy. They pressed hard upon the valiant men of the 138th Red Banner division, which towards the end of the battle held only a narrow sector along the Volga, absolutely cut off from its neighbours on the left and the right. But the proud sons of the Soviet socialist state did not bow to the insolent invader! And by the 19th November they stood on the right bank of the Volga, making certain the victory of the Stalingrad defence with their immortal valour. The *Red October* stood an invincible bulwark against the fury of the enemy onslaught. On the 31st October its defenders swept forward in an irresistible tide and recaptured the shops that the Germans had occupied.

Colonel Govorov's group, which had been cut off from the other units of the 62nd army since the middle of October and had been completely encircled by the enemy, was fighting on the extreme northern sector of the battle field, in the vicinity of Bynok and the Spartakovka settlement. All the furious attacks made by the enemy were powerless to break the staunch spirit of these defenders

who fulfilled Stalin's order to their last drop of blood.

The above is a short outline of the initial period of the battle for Stalingrad. It draws a picture of the general course of the epic struggle in which the Germans, taking the utmost advantage of their tremendous superiority of forces, pressed our troops hard on various sectors of the battle field but could not, for all their efforts, completely smash the heroic defence of Stalingrad.

The Germans had all the advantage on their side. The city's sprawling position along the river bank made it easier for the attacking side to cut up the defence line into isolated links. In the rear of the narrow place d'armes that the defenders of the city held, was a broad river, the crossings of which were under constant enemy fire. Under these circumstances the enemy could always ensure a superiority of forces on the sector of attack.

Of course, there was a tactical explanation for the success sustained by the defence. The defence pitted its fire against the onslaught of the German tanks and aircraft. The city buildings offered cover for the defenders, who could employ anti-tank guns and defensive means with the greatest efficacy. Soviet artillery played a decisive part in the battle for Stalingrad. A powerful artillery grouping whose fire supported the defence was gathered together on the eastern bank of the Volga. The Stalingrad defence forces had at their disposal all necessary equipment: tanks, aircraft, artillery and infantry machines; otherwise they would not have been able to win this hard-fought battle.

The most important factor, however, was the heroism and enthusiasm displayed by the defenders of Stalingrad. The battle broke up into numerous individual centres and in these innumerable small battles it was individual valour that determined success. The fierceness of the battle surpassed all previous examples. Brief accounts can present only the general features of this gigantic life-and-death engagement. But to depict this engagement accurately from the historical standpoint, its details, too, have to be described, for these battles for individual objects determined the fate of mankind. The names of folds in the terrain and trenches which are not included in even the most detailed maps, have become an essential part of the history of the battle of Verdun. These names were given by the men

or the Command themselves. In future accounts of the battle for Stalingrad there will be all the more reason to specially denote individual houses and buildings, the possession of which was hotly disputed for many days. The names of the Commanders and men who fought here will be immortalized.

The 1st Stalingrad Railway Station where a fierce battle raged on 17 September has entered into the annals of history. Three times the enemy stormed the station; four times the station changed hands. On 17 September Soviet soldiers won it back forever. Mamayev Mound is drenched with the blood of its gallant defenders. The Square of the Ninth of January will forever remain a monument to the brave counter-attacks made by Soviet troops, who on 21 September repulsed the enemy's attempt to win this place d'armes in the centre of the city. For eight October days a few of our units in the settlement of Orlovka fought back a furious assault made by three German divisions and one tank division. Although they were completely surrounded, the thinned detachments did not surrender to the enemy but fought their way through to the factory grounds, where they continued to fight bravely. On the night of 4 October two Guards regiments of the 37th Division crossed the Volga and occupied the Western outskirts of the Stalingrad Tractor Plant settlement. German tankists fired thermite shells and set the houses of the settlement on fire, but in these blazing houses the Guardsmen continued to fight and repulsed all enemy attacks. The 138th Division, which defended a small piece of its native soil in the *Barricade Works* in November, covered its banners with immortal fame. The ground it occupied was strewn with heaps of German dead, the Germans rushing forward in one attack after the other in a kind of wild frenzy. All supplies were cut off by the ice drift, but the heroes of this division stood their ground.

These lines serve only to suggest the gallantry which was the immortal glory of the Stalingrad defence. Our motherland created giant strength in the hearts of her sons. The supreme heroism of men who sacrificed their lives for the safety of this great city was combined with a cool courage that ensured the calm and able application of the weapons and rules of military skill. Amidst the inferno of exploding shells and bombs, in the flames of burning buildings, battles were waged in plan-

ned and organized fashion. Enemy tanks were set on fire, airplanes downed and enemy manpower destroyed. Every minor battle—and hundreds of them were fought on this raging battle field—was a marvellous manifestation of staunchness, heroism and skill. Each one of them must be described separately and only then will the history of the defence of Stalingrad have been written, only then will the meaning of what happened in these days and what shook the whole world by the beauty of courage and self-sacrifice become comprehensible.

Stalingrad teaches us respect for tactics. At the same time it is a great example of wise strategy. There is no contradiction here: tactics is subordinated to strategy, but a strategic plan must be realized tactically on the field of battle. Strategy concerns the conduct of war as a whole, tactics the conduct of individual battles. It must not be forgotten, however, that it is precisely the battle—the employment of arms against an enemy—that serves as the specific feature of war as a specific phenomenon in the history of society. War is the continuation of politics by other methods, namely the use of force.

In previous wars one could make a clear-cut distinction between strategy and tactics.

Jomini held that an engagement is the decisive encounter of two armies fighting for political and strategical objectives. Strategy brings the armies to the decisive points of the zone of operations, prepares the way for the success of the engagement and determines its results beforehand. But, he stresses, it is tactics combined with bravery, genius and good fortune that must win the victory.

Thus, strategy brought the troops to the battle field, while tactics guided them in battle. It should be said that even at that time the relations between strategy and tactics were more complicated than we are given to understand in the above exposition. There were, for instance, minor battles and general battles that determined the outcome of the whole war. It is quite natural that in the battle of Borodino the commanders-in-chief themselves—Napoleon and Kutuzov—personally directed their armies for the fate of the whole war was being determined on this battle field.

Beginning with 1914 military operations began to change radically in nature. Battles began to be fought over an area of hundreds of kilometres and lasted for weeks and months.

The battles fought in this Great Patriotic War have no parallel in military history in respect to their scale, duration and intensity. Beginning with the 22nd June 1941 and lasting until the spring of 1942 military operations were constantly conducted on a vast theatre of war. Naturally, engagements fought on such a vast scale can only be strategic in nature. In them the High Command directs the operations of armies (fronts) fighting against enemy armies. At the same time engagements of this type are the sum total of many battles, and a battle is a tactical concept. Thus, the inter-relationship between strategy and tactics is much closer now than formerly.

Let us picture to ourselves the military operations conducted on the front during the period of the defence of Stalingrad. Battles raged unabating day and night. Success or failure on any one sector was reflected on the other sectors and, in the final analysis, influenced the general situation. The result was an extremely varying and variable combination of minor military operations.

The influence exercised by a battle is direct. A battle is a contest of arms. The results of a battle may be disputed only by further recourse to arms, that is, by a new battle. The fate of an engagement and, in the final analysis, of a whole war, is determined on the field of battle. The outcome depends on the valour, equipment and military skill of the troops.

Battles were fought in Stalingrad; they were fought north and south of the city, they were fought on the Don and in the Caucasus. The situation on individual sectors sometimes changed with great rapidity, especially in view of the employment of the mobile forces of modern warfare.

We can now see how intricate is the task of a commander today, when every day, even every hour (if the situation is critical), he receives ever new reports as to the outcomes of the many different battles. The result of every battle alters the situation in one degree or another. How then, one may ask, does a unified engagement arise out of numerous, separate battles?

This happens, of course, because the commander deliberately imposes his will on the course of the conflicts and this imposition depends on the means at his disposal. Organization and discipline form the foundation stone

of an army. By means of an intricate system of administration and communications the commander sets objectives and tasks to the troops which they must carry out with all the means at their disposal and at all costs.

On the basis of the strategic plan the commander assigns tasks to the largest formations—the fronts (armies). The strategic plan is carried out in a series of operations, the nature and number of which are determined by this plan. The front (army), which carries out an operation, has two principal methods of action: manœuvring and giving battle. An operation, consequently, represents the total combination of manœuvres and battles. It may be said that an operation really is an engagement. Nevertheless these concepts are different. In speaking of an operation we have only one side in mind. An engagement, on the other hand, is a concept that includes the actions of both sides.

If operations develop in accordance with the plan of the High Command of the attacking side, the engagements will coincide with these operations. The defending side resists, but unsuccessfully; it shows no initiative. Let us, however, imagine the opposite: the stubbornness of the defence surpasses the expectations of the attacking side, or the defence has recourse to counter-attacks. In that case engagements may take place not in the localities and not in the manner envisaged in the plan of the attacking side.

In 1942 the German strategic plan provided for a series of operations with the purpose of out-flanking and taking Moscow and seizing Baku. The German plan was based on a precipitate offensive in which no halts were to be made. The original breakthrough operation corresponded to the plan. The Rostov operation was simultaneously also the Rostov engagement. Later, however, engagements took place in localities not foreseen by the plan: the Voronezh, Stalingrad, Mozdok, Novorossiisk engagements. Each engagement arose as a result of the operations conducted by the Germans but equally as the result of measures taken by the defence.

The success of a battle depends on the outcome of engagements. There is a difference, however, between success in battle and success in an engagement. An engagement is successful if the tactical task has been accomplished. The success of a battle depends upon whether or not the plan of the High Com-

mand has been realized. A battle may seem to be proceeding successfully, judging externally or tactically, but if the plan of the High Command is not being carried out the outcome of the battle is unsuccessful. In Stalingrad engagements the Germans made tactical gains, but strategically speaking they lost, for the stubbornness of the defence thwarted the German strategic plan.

Battles, therefore, arise from operations carried out by the attacking side and as a result of the measures taken by the defence. The High Command influences the course of a battle by its assignment of tasks and its directions. However, the High Command also has other means of influencing the outcome of a battle. By means of the direction it gives its other fronts (armies) it can influence the situation in the region of the given battle. The most powerful instrument at the disposal of the High Command for exercising its influence is its disposal of its strategic reserves, their introduction into the region of the given battle or on some other sector.

The existence of a solid, fortified front is of great importance for unifying military operations taking place on a vast theatre of action. Such a front serves as a support for the troops, allowing them to repulse separate attacks made by the enemy. A unified front is a connecting link between the troops and facilitates the High Commands general direction of military operations taking place over a distance of hundreds of kilometres. Inasmuch as the High Command brings unity and system into the course of military operations, it is possible to speak of an engagement taking place on a whole front or on a wide front. Thus, in the course of the summer of 1942 and the winter of 1942—1943 a battle proceeded on the southern section of the front which embraced the gigantic theatre of the Don River basin and the North Caucasus.

We see from all this how involved the concept "battle" has now become. The battle for Stalingrad, which began in June 1942, ended only in the first part of March 1943. More than a million men, and tens of thousands of guns, tanks and airplanes participated in it. However, we have not yet fully answered the question of why the battle for Stalingrad acquired decisive significance for the outcome of the whole campaign and even the whole war.

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The battle for Stalingrad arose as a result of operations undertaken by the German Command for the purpose of capturing Stalingrad. As we already know, the German Command attached great but by no means decisive importance to this task. It thought to take Stalingrad quickly, looking upon the seizure of this city as a step towards the achievement of the principal goals of the campaign. The Stalingrad operation was one of the operations that was carried out in accordance with the strategic plan of the German High Command.

The Stalingrad operation developed somewhat more slowly than was provided for by the plan but, on the whole, successfully. The gains made dazzled Hitler, and no particular consequence was attached in Berlin to unexpected delays. A day sooner or a day later, but Stalingrad was sure to be taken, they thought in Berlin. In the South the Germans were making brilliant progress: in the North—on the Don—the Russians were trying to build up a new front but it could not be a stable one. When Stalingrad was taken it would not be difficult to crack it open and advance to the north. There was still plenty of time ahead.

July passed and then August. The operation was dragging out. Hitler was demanding greater speed. Stalingrad was cut off from the north and the south and fighting was going on in the city itself.

"It won't take much longer, now," said the Germans. "The defenders of Stalingrad have been wedged up close to the Volga and it is only a matter of days, of course, before they will be cast into the river."

September. The news from Stalingrad was bad. Instead of abating, the strange, incomprehensible battle was growing fiercer. Several times the announcement was made that Stalingrad had been taken, but Hitler and the German army knew that it was not true; soon the whole world would learn the truth. Hitler sent wrathful orders, sent reinforcements, shifted aircraft from other sectors of the front. The Germans made some headway in the city, but only in terms of a few paltry metres and every metre cost rivers of blood.

Hitler grew convinced that his troops were stranded in Stalingrad. Instead of triumphant reports that the German tanks have advanced tens and hundreds of kilometres, the only "victories" reported from Stalingrad were that a settlement, a street, a station or a house had

been taken, and this after many days of hard fighting, as though the taking of a shop in a factory were a more serious matter than the taking of some European capital. Would it not be simpler to put a stop to this slaughter? After all, of what importance was it that the Russians were holding on to some miserable scraps of territory in their city? Had not the Germans in other instances, when they had encountered stubborn resistance, simply flanked the fortified district and proceeded to their objectives?

But Hitler, the ruler of Europe, whose troops had reached the Volga, had no power over Stalingrad. He could neither take it nor leave it. Stalingrad had joined worldwide renown. The Hitlerites themselves, in their desire to extol themselves, had advertised Stalingrad as a powerful fortress, as the Volga stronghold of the Soviets.

No, it was impossible not to take Stalingrad—that would mean disgrace for the German army, it would mean a blow to Hitler's prestige. He therefore kept on sending stern orders to the front, demanding and insisting.

Stalingrad was wrapped in flames and bathed in blood. Mankind had never seen such a battle as that for Stalingrad. It was a battle of guns, tanks, airplanes, a battle of men locked together in mortal combat. The eyes of all mankind were fixed upon this city. On this scrap of soil the question of who was stronger, who would win, was being decided.

The ruins of the city could not, of course, have any strategic value, but the valour displayed by Soviet soldiers, against whom all the might of the German war machine was powerless, had acquired the greatest of strategic values. Simple but infallible logic indicated to millions of people in all the countries of the world that victory was on the side of the Russians. If, having gathered together all their strength, the Germans could not defeat the defenders of Stalingrad, the Red Army was obviously stronger than they. And he who is stronger will win. There existed gun power able to hold back the German tanks. There existed will power capable of withstanding aggression. And the world applauded the heroes of Stalingrad.

Under the pall of night, amidst the ruins of the city, a brave warrior fell, slain by a German bullet. Who heard his last sigh, who saw his blood flow over the stones? The people heard and saw, all mankind heard and

saw. The heroism displayed in the defence of Stalingrad became a powerful moral force.

Worse than its actual losses for the German army was the effect on its morale of the universal recognition that the Germans had suffered defeat, that they had not been able to take Stalingrad.

It was victory or defeat on the scale on the whole campaign and even of the whole war that was disputed at Stalingrad. To use the old terminology, it was a general battle that was fought here. A general battle is one that involves the main forces of the combatant armies. However, even in past wars, by no means all the forces of the two sides involved participated in such a battle, and the general battle by no means always led to the immediate termination of the war. But it did determine the outcome of the war. Once the best, the main forces participate in an engagement, it naturally proves which side is the stronger in general. Therefore it is quite logical to conclude that whoever wins a general battle will win the war as a whole. Thus, Borodino did not terminate the war but it did determine its final outcome, since it demonstrated the superiority of the Russian army which, in combat with the enemy, showed itself able to repel the onslaught of Napoleon's "Grande Armée" and get the better of it in battle.

In modern wars the matter is much more complicated. Now it is even less probable that all the forces of both sides should take part in a general battle and that such a battle should lead to the immediate termination of the war.

The battle of the Marne in 1914 was a general battle, but the war continued for another four years. Nevertheless, this battle already indicated that the war would take an unfavourable course for the Germans, because it demonstrated Germany's inability to cope with the united forces of the allies.

In the campaign of 1941 the battle for Moscow was a general battle, for the chief assault grouping of the Germans, consisting of their finest troops, was defeated by the Red Army. The Germans still had much strength left on other sectors, they could form new divisions and continue the war. But the results of the battle for Moscow in 1941 already indicated that the war could take an unfavourable course for Germany.

The battle for Stalingrad also grew into a general battle. The Germans' main assault

grouping attacked Stalingrad and was unable to take it. The German Command shifted large new air forces and fresh troops to Stalingrad, but the Stalingrad defence remained unshaken. After Leningrad and Moscow came Stalingrad. The Red Army prevailed over the German Army, and in the minds of millions of people far beyond the borders of the U. S. S. R. this conclusion was already related not to mere individual battles but to the course of the whole war.

Now, as many centuries ago, the fate of wars is decided in battle. That is why tactics merit the greatest respect. Because of their valour and military skill the heroes of Stalingrad won the war.

Have we not, however, lost the thread of our study? In this case what really does have the greatest weight—strategy or tactics? No, we are proceeding logically and have only to draw a few conclusions to clear up the problem as a whole.

We have already said that it is the commander's main task to skilfully bring his troops to a general battle and win this battle. Whereas the general battle determines the outcome of the war, the outcome of the battle itself depends on the commander's skill. It is the duty of the commander to ensure his troops the greatest advantage in the general battle. He directs them in the battle. Strategy dominates over tactics.

Stalingrad became the centre of the struggle being waged over the whole front in the campaign of 1942. The general battle was fought here, but this happened not according to but despite the plans of the Hitlerite High Command. The very fact of a protracted battle on the banks of the Volga in itself signified the failure of the Germans' strategic plan.

The Hitlerite gambling strategy caused the Germans to scatter their efforts in several directions. In its bearing on Stalingrad, this resulted in a loss of tempo in the development of their operation. By underestimating the full significance of Stalingrad and not concentrating their main forces at once for the purpose of capturing it, the German Command gave the Soviet Command time to organize its defence. The new Soviet defence front gained strength all the way from Voronezh to Stalingrad.

The German Command involved itself in the Stalingrad battle without taking account

of the strength of the Red Army and the possibility of meeting with stubborn resistance from it. Only in the course of the battle did it begin to realize the significance of Stalingrad and of the gigantic battle that had broken out. But by that time the German Command could no longer exercise its control over events.

The opinion is sometimes expressed today that it would have been wisest of Hitler to stop the protracted battle and retreat from Stalingrad. It is said that certain German generals offered him this advice. But Hitler could not retreat. That would have signified open admission of defeat. That would have meant open admission of the superiority of the Red Army.

Events developed inevitably and consecutively. Hitler's gamble brought him to Stalingrad. A whole chain of miscalculations brought the German army into a strategic impasse. It had only one course open to it—to push ahead, but this path was firmly barred by the Red Army.

While the German troops blindly involved themselves in the battle that was to decide the whole war, the Red Army was guided to its objective by the lucid light of Stalinist' strategy. Stalin informed the troops that the decisive battle had begun. On this basis he organized the troops and directed the gigantic battle. It was precisely for this reason that the centre of gravity of the struggle shifted closer and closer to Stalingrad.

The battle raged with intense fury. By straining their resources to the utmost the Germans managed to move ahead. Bathed in blood, our Soviet knights defended themselves on mere scraps of ground, the sacred ground of the city of Stalin. Even when the trials they had to bear seemed beyond all human powers of endurance, they stood fast and believed in victory. They knew that Stalin would come to their aid.

Even the seemingly minor engagements fought on the ruins of Stalingrad, acquired strategic significance.

The defeat of the Hitlerite strategy, the defeat of the German army, grew more and more apparent. Hitler had only way out—to take Stalingrad and continue his offensive until he achieved a decisive result. He put all his cards on the table. But the Stalinist strategy preserved its trump cards. It had the final word.

(To be continued.)

THE INSURRECTION AT SOBIBUR

By P. Antokolsky and V. Kaverin

1

THE SOBIBUR death camp which the Germans opened along with those at Majdanek, Treblinka, Belzhitz and Oswiecim for the purpose of the wholesale extermination of European Jews occupied a large area in the woods near the small railroad station of Sobibur. The branch line ended here, a fact which helped the Germans to keep the existence of the camp a secret.

The camp was surrounded by four rows of barbed wire three metres high. The space between the third and fourth rows was mined and that between the second and third patrolled by camp guards. Sentries in watch towers were on duty day and night.

The camp was divided into three sections. The first contained the barracks, the carpentry, shoemaking and tailor shops and two houses for officers. The second housed the barber shop, the food stores and warehouses. In the third was a brick building with iron gates known as the "bathhouse."

The first prisoners arrived in the camp from France, Holland and Western Poland on 15 May, 1942. Below is a description of the camp by one of the prisoners, Zelma Vainberg, a Dutch Jewess.

"I was born in 1922 in the city of Zwolle in Holland. There was no bad feeling between the Dutch and the Jews in Holland. We were very friendly and never felt that there was any difference between us. Then the Germans came and we began to be persecuted. A camp for Jews deported from Germany was opened in Westerbург in 1941. When the Jews began to be persecuted and were forced to wear special identification togs the Dutch population made a point of greeting these people whenever they met them. When the Germans began shipping the Jewish population to Poland in 1941 a strike of protest was called in Amsterdam. Everything was at a standstill in the city for three days. The Dutch hid the Jews from the Germans. There were two thousand Jews in Utrecht, but only two hundred of

them were sent off. The rest were hidden from the German authorities by the local Dutch population. There was a special organisation set up in Holland for saving the Jews. It provided many of the Jews with food and money. Many Jewish refugees were saved by the *Free Holland* organisation.

"Together with the rest of my family I was sent to the camp in Westerbург. There were about eight thousand people in the camp but the prisoners kept changing as every Tuesday a train left for Poland with about a thousand people from the camp. The German officer in command told the prisoners that they were being sent to work in Poland and the Ukraine. Many went willingly enough and took food and clothing with them. The reason they were willing to go was that letters were received from people who had gone to Wlodawa saying that life in Poland was not bad. Later I found out that this was all a ruse on the part of the Germans. The people who sent these letters had been forced to sign them. There was no mention of Sobibur in any of the letters.

"All my relatives were sent off to Poland. I did not want to leave Holland and run away from the camp at Westerbург. A Dutch family took me in but a little later I was betrayed to the police by a Dutch German (a 'Volksdeutsch'). For two months I was in the American jail and from there was sent to the camp at Fichte for political prisoners and Jews. I worked in the laundry there.

"In March 1943 we were sent to Poland. Many of us had hopes of meeting our relatives there. Everything was done to make the prisoners believe that no danger threatened them in Poland. Even those who were ill were given medical treatment before being sent off. When we were passing through Germany, German Red Cross nurses boarded the train and rendered medical assistance to those who had fallen ill during the journey.

"On 9 April, 1943 I arrived in Sobibur. The men in our party were ordered to undress and proceed to the third section of the camp. The

women were taken to the barracks to undress and have their hair cut. A German officer selected twenty-eight young girls to work in the second camp. I spent five months in Sobibur."

The wholesale extermination of people is an undertaking that involves many difficulties. From the description of survivors, the camp of Sobibur was run very efficiently. There is evidence of careful planning and consideration of all the details involved in the process of exterminating people. Everything points to the shrewdness of experienced executioners who had long practised their trade. People were led to the scene of their death stark naked. Human hair from the victims was used for stuffing mattresses. There was a furniture factory on the camp grounds so that all the by-products were put to use on the spot. The very lay-out of the "bathhouse," which was main workshop in this monstrous death factory, was very complicated and required the service of trained technicians, furnacemen, watchmen, mechanics and gravediggers.

Part of this work was performed by the prisoners themselves under threat of death. In the event of refusal to work this threat was put into effect immediately and without fail.

Ber Freiberg a barber from Warsaw who is one of the few surviving inmates of the Sobibur camp, stated in his testimony given on 10 August, 1944, that about one hundred people worked in the first section of the camp and one hundred and twenty men and eighty women in the second.

"I worked in the second section," he testified, "where the stores and storehouses were located. When the people who were to be killed had undressed we collected their things and carried them off to the stores. Shoes, coats, etc. went to separate stores where they were sorted and packed for shipment to Germany. Trains loaded with victims' clothing left Sobibur every day for Germany. We burned documents, photographs and other papers as well as articles of clothing that had no particular value. Whenever we had a chance we also threw money and valuables found in pockets or suitcases into the fire so that they would not fall into the hands of the Germans.

"Not long afterwards I was transferred to another job. In the second section three special barracks had been built for women. In the first of these the women took off their

shoes, in the second their clothes and the third had their hair cut off. I was put to work as a barber in the third barracks. There were twenty barbers working there. We used scissors to clip the women's hair and stuffed the hair into sacks. The Germans told the women that their hair had to be clipped for hygienic considerations.

"While in the second section I was an involuntary witness of the inhuman treatment of these innocent people. I saw a train arrive from Belostok crowded with prisoners who were stark naked. Evidently the Germans had feared that the prisoners would try to escape. The living were lying with the dead in the cars. The prisoners had been given nothing to eat or drink throughout the journey. Chloride of lime was poured over these victims, the living as well as the dead. This happened in June, 1943."

The following is an account of what took place in the third section of the camp, in the brick building called the "bathhouse." According to the testimony of survivors, the territory of the "bathhouse" was surrounded by an inner fence of barbed wire. Those who worked in the first two sections were strictly forbidden to enter the grounds of the third section under pain of immediate death.

"When a party of eight hundred people entered the 'bathhouse,' the doors were tightly closed after them," Ber Freiberg testified. "There was an electric motor on the grounds that produced poison gas. This gas was pumped into cylinders from which it was piped through hoses into the building. It usually took fifteen minutes to kill off everyone in the death chamber. There were no windows in the building at all. There was only a small aperture covered with glass at the top where a German who was dubbed the 'bath attendant' was stationed to determine when all the persons in the death chamber were dead. He gave the signal to stop the flow of gas, after which trap doors in the floor were automatically opened and the bodies fell into the basement below. There they were loaded on to special carts which were hauled to the woods in the same section. There the bodies were thrown into a huge pit and covered over with earth. The prisoners used for loading and hauling the bodies were shot on the spot when the bodies had been buried in the pit.

"It once happened that the motor pumping the gas into the death chamber broke down

when the death chamber was already full of people. The unfortunate victims smashed the door and tried to escape. Gestapo men shot many of them and drove the rest back. The mechanics soon had the motor running and everything proceeded as usual.

"Once an eighteen-year old girl from Wlodowa, going to her death on a sunny summer day, shouted in a voice for all to hear:

"We shall be revenged. The Soviets will come and no mercy will be shown to you, bandits!"

"The Germans beat her to death on the spot with their rifle butts.

"Among the Germans in the third section probably the worst was a Berlin boxer who kept boasting of the fact that he could kill a person with a single blow. There was another German of the sentimental type, who used to go up to the naked children waiting to enter the death chamber and pat them on the head, muttering as he gave them pieces of candy.

"Hello, kiddy. Here's a piece of candy. Don't be afraid, everything will be alright."

"Once we heard particularly heart-rending cries from the third section. It turned out that women and children were being thrown alive into the furnace there.

"Scenes occurred in the camp that simply defy all powers of imagination. A young boy from Holland who was put to work sorting out the clothing of prisoners who had just arrived in the camp suddenly caught sight of articles that belonged to his family. Beside himself, he ran out of the storeroom and saw his whole family among the crowd of people going to their death. Another youth found the body of his father among the victims of the gas chamber. He tried to steal the body and bury it himself. The Germans caught him and killed him too."

All these details differ very little if at all from the tales of horror told about Majdanek or Treblinka. Probably the only thing in which the Sobibur butchers displayed any imagination or initiative was in their method of concealing their work from the neighbouring population. They kept a large flock of geese on the farm connected with the camp and whenever they carried out their gruesome reprisals these geese were teased until they made enough noise to drown out the groans and cries of the victims in the camp.

Anxiety to remove the traces of their crimes prompted the Germans to build furnaces in the third section in the summer of 1943. A

special excavator was brought into the camp. The pits in the woods were dug up and the corpses were burned. The stench of decaying bodies spread over the whole neighbourhood.

It was in this place of horror (which, despite all the documentary evidences, seems as though it must have been only the wierd imagining of a demented mind), that on 14 October, 1943 an insurrection began that ended in victory for the prisoners. This was an insurrection in which the inmates of the camp killed twelve of the German officials including the heads of the camp and four guards, an insurrection as a result of which the Sobibur camp was closed down and destroyed.

How did this happen? What human force was sufficiently strong and organised to resist the German fire directed against the unarmed prisoners? Who in this awful atmosphere of death and cruelty possessed the necessary will power, sagacity and foresight to undertake and accomplish such a thing?

On 22 September, 1943 six hundred Jewish war prisoners, Red Army officers and men, were brought to Sobibur from Minsk. Forty of them were detailed for work in the second section. The rest were put to death by poison gas or burned. Among the survivors was Alexander Pechersky, an officer of the Red Army.

2

Pechersky was born in Kremenchug in 1909. From 1915 on he made his home in Rostov-on-Don. Before the war he was in charge of amateur art activities. He was mobilised the first day of the war as a junior officer and in October 1941 his unit was encircled in the region of Smolensk and he was taken prisoner by the Germans. In May of 1942 he tried to escape but was captured with four other runaways. They were all sent to a forfeit detachment in Borisov and from there to Minsk. At the medical examination in Minsk the Germans discovered that Pechersky was a Jew.

Together with others he was confined in the basement prison for Jewish prisoners and kept there for ten days. The prisoners in this basement were fed every other day, the food consisting of one hundred grammes of bread and a mug of water.

On 20 August Pechersky was transferred to the SS labour camp in Minsk (Shirokaya

Street). He remained there until the middle of September. There were about five hundred Jews from the Minsk Ghetto as well as Jewish war prisoners. Besides the Jews there were some two or three hundred Russians who were constantly being replaced by new prisoners. The Russians were taken in custody for connections with guerillas, for failure to appear for work, etc. The prisoners just managed to subsist, depending for food mostly on what they could steal from the Germans. They worked from morning till night. "Wachs, the commandant of the camp," relates Pechersky, "couldn't let a day go by without killing somebody. One look at him was enough to see that he was a sadist. His upper lip was always twitching, his left eye bloodshot and he was always half drunk."

Once a large group of prisoners tried to make their escape from the camp. Next to the food storehouse was the Schutz-Polizei dormitory. A group of fifty prisoners working in the food storehouse managed to steal some grenades, pistols and cartridges from the dormitory. The day before the date for their getaway they were betrayed by the chauffeur who had agreed to drive them off the territory of the camp for twenty thousand marks.

The Germans herded all these involved in the plot into the cellar of a burned building, placed a strong guard around the premises and set dogs on the prisoners. After this they were led through the town with their hands over their heads. Back in the camp the torture began all over again, first flogging and then the dogs. Each prisoner was led to the heated bathhouse separately. There he was thrown into a tub of boiling water, pulled out and soused with cold water. From there the prisoners were taken into the cold and then, after a couple of hours shot to death.

This group of fifty men consisted entirely of Jewish war prisoners. Pechersky knew two of them personally—Boris Kogan from Tula and Mikhail Orlov from Kiev.

In September 1943 the Germans began to disband the Minsk camp. On 18 September Pechersky was one of a group put into a train bound for Sobibur.

The Commandant informed the prisoners that they were being sent to Germany to work. They travelled for four days in cars with boarded up windows and were given no food or drink during the whole trip. On the fifth day the train stopped at the station of Sobi-

bur. It was run onto a siding and the locomotive backed the cars up to a gate that bore the inscription "Sonderkommande."

3

Pechersky arrived in Sobibur after two years spent in German prison camps, wiser for his bitter and terrible experiences and sufficiently versed in German camp conditions to get his bearings immediately upon arriving at Sobibur.

Here is what he relates of his first day at the camp in Sobibur.

"I was sitting on some logs near the barracks with Shleima Laitman, who subsequently became my chief assistant in organising the insurrection. A man whom neither of us knew came over to us. He looked to be about forty years old. I asked him what was being burned about fifty metres from us and what caused the unpleasant scorched smell.

"Don't look over there, it's prohibited," he answered. "They are burning the bodies of the men who came with you."

"I didn't believe him but he went on,

"This camp has been in operation for more than a year. There are five hundred Jews here, from Poland, France, Holland and Czechoslovakia. This is the first time Russian Jews have been brought in. Trains with two thousand victims arrive here almost every day. They are killed off an hour after they arrive. More than five hundred thousand men, women and children have been killed on this plot of land that covers no more than 25 acres."

The appearance of war prisoners from the Eastern Front, especially of Red Army officers and men created something of a sensation in the camp. Wherever they went the newcomers were aware of eager, inquisitive eyes directed on them, eyes that seemed to expect something. The rest of the prisoners regarded with awe these people from the land of freedom in the East. They were different because they had fought the Germans with rifle in hand.

From his first day in Sobibur, Pechersky began to think about the future. What should he do? Should he try to escape the death that was probably inevitable here? But if he escaped by himself or with a small group of comrades it meant leaving the rest to torture

and death. After thinking it over, he dropped the idea.

Right from the beginning the idea of escape was inseparably linked in his mind with the idea of revenge. To take revenge on the German butchers, to exterminate them, free all the inmates of the camp and if possible to make connections with the guerillas—such was the way he pictured his future operations. The impossibility of ever accomplishing them did not daunt Pechersky.

The first thing to be done was to study the layout of the camp and the daily routine of the prisoners, the officers and the guards. Pechersky realised that everyone in the camp was as anxious to escape as he was but how was he to find people whom he could rely on for actual assistance among this crowd of strangers, people whose physical and perhaps moral strength had been shattered.

Five days after his arrival in Sobibur Pechersky was called over to the women's barracks. There he found an international group, most of whom knew no Russian. He was showered with questions, and the talk led to a sort of political consultation. The situation was all the more complicated in that Pechersky did not know the people he was dealing with. It was quite possible that there were spies among them, planted by the camp authorities. Pechersky spoke in Russian and volunteer interpreters explained his answers to the many questions put to him.

Pechersky told them how the Germans had been routed at Moscow, encircled and wiped out in Stalingrad, how the Red Army was approaching the Dnieper and would soon be crossing the German frontier.

As best he could Pechersky also told them that he knew about the guerilla warfare being waged on the occupied territory of the Soviet Union. While in Minsk he had heard stories of German trains derailed by guerillas and of open insurrections in some cities.

The prisoners listened to him in tense silence, anxious to catch every word. Those who understood any Russian at all immediately translated for their neighbours. These people, doomed to death in the camp, were sincerely and profoundly moved by this story of another country's bravery and struggle.

"Tell us," some one spoke up in a timid voice, "if there are as many guerillas as you say, why don't they attack this camp?"

"Why should they?" was Pechersky's

answer. "To free you or me? They have plenty of things to do without that. No one is going to do our work for us."

And saying this Pechersky abruptly turned on his heel and left the barracks, slamming the door behind him. No one attempted to translate his last words. Their meaning was clear without translation.

The impression that Pechersky carried away from this first talk however was that all the prisoners dreamed of escaping from the camp.

The next day the prisoners were put to work unloading bricks from a freight train. Each one had to pick up six or eight bricks, run two metres with them, put them down carefully on the ground and run back to the freight car. Whoever failed to pick up his load of bricks on the run or dropped a single brick was flogged. The sound of whips switching through the air could be heard all day long. After they had finished, a group of prisoners came up to Pechersky. Among them was Shleima Laitman.

"Sasha," said Laitman, "we have decided to run away. There are not very many guards. We can kill them and run off to the woods."

"That's easier said than done," was Pechersky's rejoinder. "While you'll be finishing off one sentry, another will open fire on you from the watch tower. But let's suppose that we could finish off all the guards. What can we use to cut the barbed wire? How can we get across the mined field? What will happen to these left behind? Have we the right to forget about them? Run away, if that's what you want! I won't stand in your way but I won't go with you."

And Pechersky walked off with one of the group who called himself Kalimali. The plan was given up.

Just about the same time another incident occurred which strengthened Pechersky's decision. The same middle-aged man with whom he had had a talk on the first day he arrived at the camp approached him again. His name was Baruch and as Pechersky later learned he was a tailor by trade. Baruch had been present during Pechersky's talk at the women's barracks. Now he came to warn Pechersky that the latter was being watched.

"Did you notice the tall thin fellow standing near me in the barracks yesterday?" Baruch asked Pechersky. "That's Bzhetsky, a confirmed scoundrel. He understood everything."

"Wait a minute," said Pechersky. "Just what are you making such a fuss about? Why should he be watching me? I have no intention of doing anything out of the way. It's absolutely hopeless to think of escaping."

Baruch was silent for a moment.

"You don't trust me, and you're right not to," he said, after a while. "It's only a few days since we met. But we have no other choice. You may leave the camp suddenly and then our last chance will be gone. Can't you see," he said, clutching Pechersky by the arm, "there are many like me and we all want to make our getaway. But we need a man who can lead us and show us what to do. Trust us. We know a lot about the camp and can help you too."

"I looked at his frank, kind face," Pechersky relates, "and wondered whether he was a traitor. But then I decided that I had to take the risk, one way or another."

"How are the mines laid in the field behind the barbed wire fence? Do you understand what I mean?" I asked Baruch.

"Not quite," he answered.

"Mines are usually laid zigzag like checkers."

"Oh, now I understand," said Baruch. "That's the way they're laid—about one and a half or two metres apart."

"Thanks," I said. "Now I have a favour to ask of you. Introduce me to some girl here."

"A girl?" asked Baruch, obviously astonished.

"Yes, a girl. There was a young girl standing at your right yesterday, from Holland I think. She has short chestnut colored hair. She was smoking. She doesn't speak Russian but that makes it all the better. She'll do. There is no need for you to be seen talking with me. Laitman and I sleep next to each other and he can always pass any messages on to you. Now, if it's all the same to you, let's go to the women's barrack and you can introduce me to that girl."

A few days passed. Every evening Pechersky met Lucca, that was the name of his new acquaintance, the young girl from Holland. They would sit on the pile of logs near the barracks. First one, then another of the prisoners would come up to Pechersky and start talking to him, seemingly about the most ordinary things.

Bzhetsky, the spy, who knew a little Russian, was also usually hanging around. As

soon as he would come near the couple Pechersky would start playing around with the girl. From the very first Lucca realised that she was involved in some sort of serious game but Pechersky did not let her into the secret. She entered into the conspiracy and kept her silence. Pechersky was an "easterner," a Soviet citizen. That was enough to rouse Lucca's hopes and make her trust him.

She told Pechersky the story of her life. She had managed to hide the fact that she was the daughter of a German communist who had fled from Germany when the Nazis came into power. Her father had succeeded in eluding the Germans for the second time when they occupied Holland. The Germans arrested her and her mother and killed her brothers. She and her mother had then been sent to Sobibur.

The relations between Pechersky and Lucca remained very friendly all through those tragic days. Accustomed to conspiracy since childhood from the necessity of concealing the fact that her father was a communist, Lucca clearly understood why Pechersky kept her in the dark as to his plans.

Thus, without arousing anyone's suspicions, Pechersky gradually came to know the people with whom he had to deal and incidentally to become acquainted with the layout of the camp, the morale of the prisoners and the routine of the guard.

On 7 November he again had a talk with Baruch, this time over the chess board.

Here is the story as Pechersky relates it.

"Baruch and I were playing chess and I told him what I had decided."

"Here's the first plan," I said. "It's a hard one and probably impossible to accomplish but I'll tell you about it anyhow. The carpentry shop is about five metres away from the barbed wire. The rows of barbed wire are four metres apart. Then come fifteen metres of mined field. Add to that seven metres inside the carpentry shop and you have a total of thirty-five metres. We would have to dig a tunnel. I figured out that we would have to hide about twenty cubic metres of earth under the floor and in the garret. The digging would have to be done at night. This plan has two shortcomings. First, six hundred people can hardly crawl through thirty-five metres of tunnel in single file in one night. Second, if we could get away, it would mean leaving the Germans untouched. Talk this plan over

with your people. As for the second plan, I can't tell you anything about it as yet.'

"'Why?'"

"'Because I need some more information. Meanwhile, can you undertake to get seventy knives or razors? I could give them out.'

"'Alright, I can do that,' said Baruch. 'Now I want your advice on one important thing. Monya is one of the fellows in our group. You know him, he is one of the young fellows building the barracks. Yesterday Bzhetsky came up to him and told him that he knew about the plans being made for an escape. Monya, of course, tried to throw him off the scent and told him that nothing of the sort was going on. Bzhetsky listened to him and said that he would like to join us and escape too.'

"'I thought for a while,' Pechersky related. 'Although it looked like a trap I was caught by the idea that such spies might be used to our advantage.'

"'In Monya's opinion,' Baruch continued, 'you can rely on Bzhetsky even if he is a spy. He knows perfectly well that in the final run the Germans will kill off all their spies too. They can't leave any living witnesses of their crimes.'

"'Well, what did you tell Monya?'"

"'That I couldn't decide until I had asked you.'

"'All right, we'll have to think it over. Meanwhile we'd better stop playing.'"

Raiman, a prisoner who worked in the forge shop, made the knives that Pechersky asked for. The forge shop was located next to the machine shop. On the evening of October 10 several men gathered in the forge shop. Bzhetsky was one of them. The German guards had sent a gramophone to the machine shop to be repaired. Pechersky and Laitman had been invited to listen to some records. The men began to talk about everything but what was on their minds. They started the gramophone.

"I began talking about different records," relates Pechersky. "Bzhetsky kept trying to switch the conversation over to the plan for escape but on one pretext or another I steered clear of the subject. Finally he winked at Raiman who took up the gramophone and went into the machine shop. All the others followed him. Bzhetsky and I were left alone.

"'I wanted to talk to you,' he began. 'I suppose you know what about.'

"'What makes you think that I know?'"

"'If for no other reason than that you pretend not to know.'

"'I have a hard time understanding German. That's probably why I seem to be pretending.'

"'All right, then let's talk Russian, although I speak it very badly. Please hear me out. I know that you are planning to escape.'

"'Nonsense. It's impossible to escape from Sobibur.'

"'You are very careful. You very seldom go to the barracks. You are never seen talking to the other prisoners, with the exception of Lucca. But she is only a screen. Sasha, listen to me. If I had wanted to betray you I could have done it long ago. I know that you think I'm a rotter. Right now I've neither the time nor the desire to convince you that you're wrong. Let it be. But I want to live. I don't believe Wagner's promise that we spies will not be killed. They'll kill us and how! When the Germans get ready to close down this camp they'll destroy us along with everything else.'

"'Well, it's a good thing you realize that but why do you pick me to tell it to?'"

"'I can't help but see what's going on. All the others only carry out your orders. Shleima Laitman is your spokesman. Sasha, believe me, if the spies are on your side, the whole thing will be much easier for you. The Germans trust us. We have the right to move about the camp freely. To make a long story short, we want to come in with you.'

"'Whom do you mean by «we»?'"

"'Chepik, the spy in the bathhouse crew, and myself.'

"I got up and paced the floor for a few minutes.

"'Listen, Bzhetsky,' I said, looking him straight in the eyes, 'could you kill a German?'"

"'He did not answer at once.

"'If it were necessary for the good of the cause, I could.'

"'And if it were not for the good of the cause, but simply like that, just as they kill hundreds of thousands of us...'"

"'I never thought of that...'"

"'Thanks for being frank. Well, it's time we left.'

"'All right. But please think over what I've told you.'

"I told him that there was nothing to think over, said good-bye and left him. But the

very fact that Bzhetsky had hesitated before answering my direct question about killing a German made me wonder whether he was really acting the spy in this case. A spy would have agreed at once."

The next day, 11 October, the prisoners working on barrack construction in the Nord-Lager heard shouts and then tommy-gun shots. The Germans immediately herded everyone together, forbade anyone to leave the workshops in the first section, closed the gates and placed additional guards on duty. Only at five o'clock the prisoners found out what had happened. The regular trainload had arrived that morning. When the victims were undressed and were being led away they guessed what was going to happen and started running in all directions in a desperate effort to escape. Stark naked, the unfortunate people could only get as far as the barbed wire. There the Germans met them with tommy-gun and rifle fire.

The meeting at which the final plan for escape was adopted took place on the next day, 12 October, in the carpentry shop. Those present included Baruch, Laitman, Yanek, head worker in the carpentry shop, Monya, Pechersky and several others of the group of Soviet prisoners. Two prisoners sat talking in the yard and two others were at the gates of the first section while the meeting went on. They were posted to warn the others in case of danger. The meeting began with the question as to what was to be done with Bzhetsky. It was decided to ask him to come to the meeting. Monya went out and in a few minutes came back with Bzhetsky.

"We have decided to let you in, Bzhetsky," said Pechersky, "but in letting a fellow like you into our plans, we are risking the fate of all the people in the camp. So remember, in case of the slightest hitch, you will be the first to go."

"I know that," replied Bzhetsky.

"And so, comrades," Pechersky went on. "Here is the plan which I consider feasible. We have to kill all the German officers. It goes without saying that we shall have to deal with each of them separately, but the whole thing will have to be done in a very short time, no more than two hours. The job of killing the Germans will be given to the eastern Jews, the war prisoners, whom I know personally and whom I can vouch for. After dinner, at half past three, Bzhetsky will take

three men to the second section on some pretext or other. These men will kill four of the officers. At four o'clock the electricians will cut the telephone wires that lead through the second section to the reserve guards. At the same time we shall begin to finish off the Gestapo men in our part of the camp. We shall have to devise some means of getting them into the workshops and killing them one by one. Everything has to be finished in our part of the camp within a half hour. At half past four Bzhetsky and Chepik are to line up all the people in the camp as if they were going to work and the whole column will go towards the gates. The easterners will be in the front lines. On the way to the main gates we shall have to seize the arsenal if possible without making any disturbance. Remember that while the column is moving it will be very easy to start a panic and then everything will be lost, as the Germans will discover what is going on. If we succeed in taking the storehouse we can put up a fight, if not we shall have to make a break for it. Not far from the carpentry shop, right at the barbed wire fence is one of the officer's houses. We can be pretty sure that the Germans have not mined the field near the houses. It is possible that they have laid a few signal mines there, but nothing more. So this is the best place to start cutting through the wire. Well, there's the whole plan. Think it over until tomorrow. Anyone have any objections?"

Baruch answered for the rest. There were no objections.

4

This insanely bold plan was conceived by a mind that craved freedom and craved revenge. It goes without saying that such a plan could be carried out only if the utmost secrecy and precision were maintained.

It is no wonder that Pechersky put down the details of each hour of the next day, 14 October, in his notes.

In the morning he worked in one of the barracks from the windows of which he had a view of the whole camp. The seven men working with him knew nothing about the proposed plan of escape. In the next barracks, twenty easterners selected from a special list were building bunks under Laitman's supervision. At ten o'clock Laitman called Pecher-

sky over and told him how things were progressing.

Here is the story in Pechersky's own words: "Untersturmführer Ernst Berg is supposed to come to the tailor shop at four o'clock for a fitting of his new uniform,' Laitman told me. 'At four fifteen Oberscharführer Goetzinger (the head of the third section) is due there. Unterscharführer Emil Schumacher is expected at the shoemaking shop at four o'clock. I shall take care of Unterscharführer Friedrich Gaulschicht myself. Four of the Germans will be killed in the second section and the fellows will try to get the rest to come into the workshops on some pretext or other.'

"All right, send the fellows who have undertaken to kill the Germans in to see me, one by one.'

"In five minutes Kalimali came into the barracks where I was working.

"At three o'clock,' I told him, 'you are to go to the tailor shop. Take a plane, a chisel and an axe with you. And remember, Kalimali, if you miss, we all perish. Do you understand?'

"Perfectly.'

"Well, you can go. Good luck.'

"I shook hands with him and he left.

"A half hour later Boris Tsibulsky came in. He was to kill the Gestapo officer in the second section.

"Boris,' I told him. 'The time has come. I'm giving you the hardest job. Mikhail and Benya will be with you. Take two axes. Bzhetsky will take you into the second section. Remember, Boris, you will be the first to start. Your blow has to inspire the rest. If the fellows who are supposed to go with you are afraid, get someone else in their places. This is no job for people who are only in it because they have to be.'

"Don't worry, Sasha,' he said. 'They are only waiting for the signal to begin.'"

At two o'clock one of the Gestapo officers unexpectedly came into the first section and led Bzhetsky and three other prisoners away. The terrible thought that the plan had been discovered sent fear into everyone's hearts.

Within an hour it turned out that Bzhetsky had been taken into the Nord-Lager to stack timber. Chepik undertook to do the job that Bzhetsky had been supposed to do. He led off the men who were to kill the Gestapo officers in the second section.

The atmosphere in the camp became even more tense. Although the whole conspiracy was kept a dead secret from everyone except the direct participants, a feeling of hope was evident through the silence and fear that reigned in the camp. The rumour of something imminent gained strength. Thus the ground was prepared for the events that took place on 14 October.

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The first German to be killed was Untersturmführer Ernst Berg who showed up at the tailor shop twenty minutes earlier than he had been expected. When Berg had taken off his belt with his pistol in the holster, and began fitting his uniform, Kalimali hit him over the head with an axe. They threw his body on a cot and covered it with a blanket.

"It was not yet four o'clock when Kalimali ran in to barracks and handed me a German pistol," relates Pechersky. "We embraced each other.

"The die is cast now,' I said. 'Even if anyone wants to back out, it's too late. Thanks, pal.'

"Kalimali went out. Suddenly one of the Dutch prisoners in the barracks got up, deathly pale, and tried to leave the room after Kalimali.

"Where are you going,' I asked him.

"I have to go out.'

"Get back. You can wait. Comrades, you understand what is going on,' I said appealing to all the people in the barracks.

"Watch that fellow. Don't let him out.'"

At ten minutes after four Semyon Mazurkevich killed Michel, head of the camp guard force, in the same tailor shop where Berg had been killed. At the same time Arkadi Vaispapa killed Oberscharführer Goetzinger in the shoemaking shop. At four fifteen Tsibulsky informed Pechersky that he had carried out his assignment. The four Gestapo officers had been killed, the telephone wires cut and the exits closed.

It was now time to line the prisoners up in a column.

Pechersky decided to wait, however. He still hoped that the men would succeed in killing some more of the Germans.

Meanwhile Shleima Laitman killed another Gestapo officer Friedrich Gaulstich.

At half past four Bzhetsky returned. He was just in time because only he or another of the

spies could line up the prisoners in a column without arousing suspicion.

The stock of weapons seized by the prisoners was not very large—there were eleven pistols taken from the bodies of the murdered Germans, and six rifles which the tinsmiths had hidden away some time before. The prisoners had to make the best of what they had.

At four forty-five Bzhetsky gave the signal for all the prisoners in the camp to line up. People came running from all directions in answer to the sharp whistle.

The head of the guard patrol, a German from the Volga region, tried to drive the people back into the barracks but he was killed.

The crowd ran towards the arsenal but machine-gun fire barred the way. Pechersky realised that it would be impossible to seize the arsenal. He shouted:

“Comrades, forward!”

The prisoners dashed after him, heading for the officers’ house. Many ran in the opposite direction toward the central gates.

The sentries were overpowered. People ran forward over the mined field toward the woods visible in the distance. Many were blown up by mines. Of the six hundred who fled, four hundred reached the woods.

Chaim Pavrosznik, a carpenter from Chelm, who had been a soldier in the Polish army and was taken prisoner by the Germans in 1939 relates the story as follows.

“A large group of people gathered in the camp. In the center was our leader, Sasha (previously Pavrosznik had called Pechersky ‘That fine chap from Rostov’). Sasha shouted:

“‘For Stalin, hurrah!’

“Breaking up into small groups, we scattered in different directions through the woods. The Germans tried to get us by different methods. Aircraft appeared over the woods, combing the area with their machine-gun fire. Many were killed. No more than fifty survived. I managed to get to Chelm where I hid until the Red Army came. The day the Red Army came brought me, a prisoner of the Sobibur camp, back to life.”

Zelma Vainberg relates her part in the story.

“When the insurrection began in the camp, I was one of those who got away. Two other girls, Ketti Khokes and Urzhlya Stern were with me. Ketti later joined a guerilla detachment and died of typhus fever. Urzhlya also fought with the guerillas. She is now in Wlodawa. I was with her in Westerborg and in the Fichte jail. We went through the hell of Sobibur together and ran away together.”

The fate of Lucca, Pechersky’s helpmate in the conspiracy, is still unknown, as is her real name.

On 22 October, after roaming the roads and villages of Poland, Alexander Pechersky came up with a guerilla detachment which he and several of his companions joined. He is now in the Red Army and holds the rank of captain.

On the spot of Polish territory that once marked the location of the Sobibur death camp, the wind now sings through the rusty barbed wire. The fields sown with potatoes and cabbages by the Germans to hide the traces of their monstrous crimes have been dug up again. In them have been found the remains of human bones, sundry items of camp equipment, old shoes of all sizes and fashions, numerous bottles bearing labels of Warsaw, Prague and Berlin firms, children’s teething rings and old men’s false teeth, Jewish prayerbooks, picture postal cards with views of European cities, documents, photographs, tin cans and glass cases, children’s dolls with twisted arms and finally, the most inexorable and accusing witness of the crimes committed here—a large human skull, washed clean and bleached by the rain.

The suffering of the people who perished here, their tears and death agonies are over. These people have passed on.

The few who survived have told all that they knew and saw.

If you leave this spot and go due west you reach the German border. It is furrowed with shells made of metal from the Urals and torn up by the treads of tanks.

The Red Army brought retribution for the sufferings of oppressed peoples into the very heart of Germany.

ALL-UNION CONFERENCE ON ARCHEOLOGY

AN ALL-UNION conference on archeology called by the U. S. S. R. Academy of Sciences was held in Moscow in 1945. The Marr Institute, the Academies of Sciences of the various Union Republics, branches of the U. S. S. R. Academy of Sciences, People's Commissariats of Education of the Union and Autonomous Republics, universities, teachers' colleges, central, territorial, regional and municipal museums, the Commission on the Preservation of Ancient Monuments and other scientific bodies were represented at the Conference by one hundred and fifty-six delegates.

The conference was opened by V. Volgin, Vice President of the U. S. S. R. Academy of Sciences and Chairman of the Committee for organising the conference. In his opening speech Academician Volgin reminded the delegates that the Marr Institute—the leading centre of Soviet archeology—had recently celebrated its twentieth anniversary. Founded as the Russian Academy of the History of Material Culture, it succeeded the Committee on Archeology which had been in existence since 1859.

Soviet archeologists fondly cherish the traditions established by outstanding Russian archeologists of the past. They revere the memory of Academician Nikolai Marr and are continuing the work begun by this great scientist who invested archeology with new meaning by linking the study of archeological objects with data obtained from other sources, notably language. By assimilating what was most valuable in pre-revolutionary archeology and at the same time breaking with its amateur approach and its interest in collections as such, Soviet archeologists have succeeded in winning recognition for the his-

tory of material culture as a bona-fide historical science.

We no longer support the teachings of former archeologists that the ancient history of our country was represented by separate "archeological civilisations." We regard it rather as a harmonious and logically connected chain of consecutive stages in the development of humanity from the stone age to the Middle Ages.

The problem of the origin of the Slavs and their relations with neighbouring tribes is now presented from a new angle. Archeologists have traced the first stages in the formation of the Slavonic tribes to the beginning of our era. Scientists of today base their conclusions on material found in strata dating back to the Bronze Age and neolithic civilisations. More and more light is being shed upon the unification of the Slavonic tribes in the first thousand years of our era which exerted a tremendous influence upon the history of Eastern and Central Europe.

Academician B. Grekov delivered a report on the achievements of archeological investigations in the U. S. S. R. He pointed out that interest in relics of ancient culture has long existed in Russia. As early as 1804 a scientific society called Society of History and Russian Antiquities was founded in Moscow. As stated at the time, this Society was interested, among other things, in collecting antiquities, medals, coins and other objects shedding light on various events in Russian history.

Pre-revolutionary archeology excavated much material connected with the ancient history of the peoples inhabiting the territory of Russia. The remains of Hellenic civilisation in the northern regions of the Black Sea

coast, objects excavated from Scythian burial mounds and other materials cleared up many previously unexplored periods of Russian history. It was mostly due to the efforts of archeologists that a new field of study was opened to historians—the study of the Scythians who inhabited the territory of the present U. S. S. R. before the Slavs. Parallel with these investigations, archeologists unearthed the monuments of ancient Slavs in the Caucasus and Siberia.”

While Soviet archeology inherited a well grounded scientific knowledge of the subject and made able use of past achievements, it also contributed something of its own which gave this science a new place in the system of sciences and placed new tasks before it. In order to clarify its observations and conclusions, Soviet archeology established firm ties with paleo-anthropology, paleozoology, geology, soil science, philology and history. At the present time archeology no longer stands apart from the general aims of history but is itself an historical science solving the same problems and pursuing the same aims in its own specific field and on its own specific materials.

Since the establishment of the Soviet government the number of sites investigated by archeologists has greatly increased. At the present time there is not a single region or nationality in the U. S. S. R. which has not been the object of study by Soviet archeologists.

Academician Grekov described the results of archeological studies of certain extensive periods in the history of human society which were carried out on the vast expanses of the Soviet land.

Soviet archeology has outstanding achievements to its credit in the study of the Stone Age. Hundreds of paleolithic sites have been discovered and investigated, including those at Kostenko-Borishevsky, Gagarino, Timonovka, and Malta and Buret in Siberia. Parallel with these studies archeologists have charted the various periods in the Russian paleolithic age, establishing the characteristics of its three main provinces—Asia, Europe proper, and the regions of the Caspian Sea. These discoveries contributed much that was new to the existing conception of forms of paleolithic tools and implements and of the art and mode of life of the people of that epoch.

Only in the Soviet period did archeologists begin to make a serious study of neolithic civilisation on the territory of the U. S. S. R. Thorough investigations of a number of regions (the central part of European Russia, the Karelian-Finnish S. S. R., the Urals, and the Baikal area) made it possible to distinguish between the various neolithic civilisations and determine their chronological sequence. The new discoveries made in the course of these investigations, particularly the rock drawings in Karelia, the Gorbunov turf-pit, the Olen-Ostrovsky burial mound, and others, shed light on the religious conceptions of the neolithic age, an aspect heretofore little studied.

Extensive investigations of the civilisation of the early Bronze Age were also made during the Soviet period. Excavations along the Dniester and the Southern Bug rivers and at Usatovo near Odessa demonstrated the existence of various stages in the development of Tripolye culture and proved its prevalence in the whole Dnieper and Danube basin during the period from 3000 to 1000 B. C. Distinctions were established between the Bronze Age cultures in the Northern and Southern Caucasus, the Shingavitsky and Augbekovsky cultures dating to the early Bronze Age, the Kuban burial mounds and Elar and the excavations at Tripaleti, all of which contained remains of highly developed Bronze Age cultures. Excavations at Urartu brought to light considerable material on the history of ancient Armenia. Investigations carried out in the Black Sea regions and in the Ukraine established the chronology of three main cultures—those characterised by pit, catacomb and hut dwellings. The origin of each of these three types was clearly defined and investigations were made of settlements of this period for the first time. It was established that the final stage in the development of Bronze Age culture was that of the Cimmerians, who inhabited this region previous to the coming of the Scythians. In the Volga Regions investigations established the existence of two cultures—that of Poltava (the beginning of the Bronze Age) and of Khvalinsk (the end of the Bronze Age). Investigations in Siberia established three stages of the Bronze Age as represented in the Afanasyev, Andronov and Karasuk cultures. A new culture—the Abashev—was discovered in the Chuvash republic and adjacent regions.

The study of the Scythian-Sarmatian culture is of great significance for a knowledge of the population in the pre-Slavonic era and for determining the ethnogeny of Slavonic tribes. New excavations were carried out on the ancient sites of Kamensk, Sharapovsk and Nemirov as well as on the right bank of the Bug River and the western coast of the Black Sea. Excavations were also made of Scythian-Sarmatian burial mounds in the Kuban, the southern regions of the Dnieper and in other localities.

Soviet archeologists continued the excavations begun in the ancient cities of the Black Sea region—Olvin, Khersones, Phanagoria and Kharabs. Excavations were also begun at less important ancient sites.

A more profound comprehension of the Scythian problem, as Academician Grekov pointed out, prepared the ground for a revision of views concerning the origin of the Slavs, particularly of the eastern branch, and the formation of a large Russian state in eastern Europe. Scientists of the old school clung to the prevailing but mistaken theory which claimed the Slavs to be aliens in the eastern European plains. In our time, thanks principally to the finds of Soviet archeologists, new investigations have confirmed the ethnogenetic chart outlined by Academician Nikolai Marr confirming the local origin of the Eastern Slavs whose roots go back to the tribes of the Tripolye culture, to the Bronze Age civilisation in the steppe regions, to the Scythians and finally to the epoch of field burials. Agricultural tribes of Scythians along the middle course of the Dnieper as well as tribes from the upper reaches of the Dnieper, whose culture has been studied only in the past few years, are now accepted as component factors of the Slavonic ethnogeny.

One of the most important subjects of Soviet archeological research has been that of the Antae and their culture. Investigations of this problem can confirm the existence of definite connections between Antean culture and that of the preceding burial field stage of culture and can also show the more original nature of Antean culture and its higher stage of development. Evidence pointing to this is found in their field agriculture, livestock breeding, skilled arts and crafts and large settlements of an urban type. Beyond question the centre of Antean culture lay in the middle reaches of the Dnieper, in the regions

later inhabited by the Polyans. It may also be considered an established fact, that the culture of Kiev Russ is a successor of Antean culture.

In this connection Academician Grekov dwelt on the researches of Soviet archeologists concerning Russian culture and in particular ancient Russian cities. The first stage in these researches was devoted to revealing the "pre-history" of these cities, going far back into the pre-feudal period. The most important of these ancient cities were those which preceded modern Kiev, the settlements of the eighth and ninth centuries on the ancient site of Ryurik near Novgorod, the cultural strata of the fifth and sixth centuries underlying the Pskov Kremlin and the ancient strata of Staraya Ladoga dating back to the seventh and eighth centuries.

Taken in conjunction with the collections obtained by pre-revolutionary expeditions the many handicraft objects found in recent excavations enable archeologists to have a detailed picture of the evolution of urban crafts, their connection with and influence upon rural crafts, the progress and differentiation of technical methods and the labour skills involved in each particular craft. A study of the cast forms, for instance, and of craftsmen's marks, throws light on the social position of the latter, their organisations, etc.

Academician Grekov especially noted the work of Soviet archeologists in studying the history of ancient Russian architecture and in the discovery and investigation of a number of important relics of ancient Russian art.

Soviet archeologists have also considerable achievements to their credit in studying republics and regions of the country heretofore little explored from the archeological point of view. In the Northern Caucasus, for instance, investigations have brought to light considerable material relating to the Neolithic Age, and a large number of finds dating to the Bronze Age. Objects belonging to the period of antiquity and the middle ages have also been found in this region.

Materials relating to various periods of the Bronze Age have been unearthed at the site of a Shingavitsky settlement, on Shersh-Blur and in Elar. Particular interest attaches to the findings made by the expedition of the Georgian Academy of Sciences in the Trialet burial mounds. Excavations of the Samtavr tomb near Mtskheta furnished very valuable material relating to the ancient Georgian king-

dom. New findings which shed light on the later Urartu epoch have been unearthed on the hill of Kamir-Blur by expeditions of the Armenian Academy of Sciences. Extensive research has been carried on in Azerbaijan concerning Cyclopean edifices. Investigations of medieval cities in Armenia and Georgia have been launched on a large scale. All these and many other excavations have produced copious material on the ancient history of the peoples inhabiting the Caucasus and the Transcaucasus and their relations with ancient eastern states.

Excavations in Central Asia have unearthed Kelteminar and later Tazabagyab cultures which indicate historical connections between the population of ancient Khorasm and the north (the Afanasyev and Andronov cultures), and the east (the Anau culture). Expeditions in Shakhrisyabs, Urgench and Khorasm and the excavations of ancient Taraz, all of which unearthed material on a later period in the history of Central Asia, have proved the existence of cultural relations between the ancient population of Central Asia and the states of the Near East.

While in the pre-revolutionary period archeologists knew of only three paleolithic sites in Siberia, more than sixty are known today. This has made it possible to establish the various periods in Siberian paleolithic cultures: neolithic settlements in the lower reaches of the Amur, on the shores of Lake Baikal, on the Angara, the Yenisei and the Ilim rivers. A study of the findings of the Bronze Age enabled archeologists to establish the first appearance of livestock breeding, agriculture and the smelting of metal. Three stages of Siberian Bronze Age culture have been established—the Afanasyev, the Andronov and the Karasusk. The dissemination of northern Chinese bronze as far west as the present cities of Molotov and Gorky raises the question of the role of cultural relations with the Far East as well as with the Near East, in forming a cultural unity among the peoples inhabiting the territory of the U. S. S. R. in ancient times. Remains corresponding to Scythian-Sarmatian findings in the Southern regions of the European Russia have been discovered in Siberia.

In archeological research work concerning the peoples of the Volga and Ural regions, particular attention has been paid to the so-called Ananiynsky Culture which is a connect-

ing link between the Bronze Age and the formation of now existing nationalities of these districts. During the Soviet period large-scale investigations have been begun to elucidate the early history of the Udmurts, the Komis, the Bashkirians and the Mordovian tribes.

Soviet archeologists have given considerable attention to a study of the Bolgar and Khazar cultures. It is now possible to reconstruct a picture of the life in the Bolgar cities of the Volga Region (Bolgari, Suvara and others) both in ancient times and in the period of the Golden Horde. A systematic study of the material relating to the Khazars has made it possible to elucidate a number of obscure aspects of Russian-Khazar relations in the history of the Slavonic-Russian colonisation of the southeast.

Without the efforts of archeologists the early pages of the history of the Bulgars, the Khazars, the Eastern Slavs and the even earlier Scythian and Greek colonies on the north coast of the Black Sea and of ancient Armenia and Georgia would still remain unknown to us. Thanks to the achievements of archeology, modern historical knowledge has been considerably extended.

Academician Meshchaninov delivered a report on the planning of archeological expeditions in the U. S. S. R.

Many of the archeological investigations, both theoretical and field researches, outlined for the 1945—1949 period are closely linked with key problems concerning the history of Soviet peoples which have been singled out for attention in the last few years. In most cases plans for large-scale excavations provide for the cooperation of several scientific institutes.

The plan also provides for systematic researches covering several years and extensive regions. In liberated cities where reconstruction will be carried on on a large scale, appropriate archeological work is being planned as well as measures for preserving the most important monuments of the past.

One of the tasks confronting Soviet archeologists is that of restoring the collections of many of the museums plundered by the Nazis and the restoration of many treasures of Soviet art and architecture damaged during the German occupation.

Academician Grabar made a report on new legislation concerning the preservation and study of archeological monuments.

THE SARATOV-MOSCOW GAS MAIN

By I. V. Abramov, M. S.

IF IT WERE possible to go up in an aeroplane and take in, at a glance, the whole line in construction, from end to end, one would see a picture of creative, harmonious labour being done by tens of thousands of workers and hundreds of engineers and mechanics. The work goes on continuously day and night. An endless line of trucks comes and goes hauling pipes, construction materials and machines.

The length of the gas main is over 800 kilometres. According to the approved project, the gas main will run through the territories of five regions, will cross 100 rivers, 5 lakes, dozens of marshes, will pass under 20 railway lines. In the course of construction three and a half million cubic metres of earth will be excavated, over 50 thousand tons of steel tubes laid, 30 million bricks, and 250 thousand cubic metres of timber used. Six powerful compressor stations will be built to control the pressure of the gas in the main. Over a million tons of various freights will have to be transported to the gas main and used in its construction, not counting provisions for the workers.

Within the city limits of Moscow the Saratov gas will be distributed through 115 kilometres of gas mains and 75 kilometres of mains lead into residential, municipal and industrial buildings. All the present gas burners on Moscow stoves will have to be changed since the calorific power of the Saratov natural gas is higher than that of the illuminating gas produced by the Moscow gas plant. Much new gas equipment will have to be produced for new consumers. In order to meet this new demand the capacity of the Moscow plant *Gasq-apparat* is to be increased to almost three times its former capacity, and at least 25 other plants in various localities are to work in cooperation with the Moscow one.

Fifteen kilometres from Saratov, where the gas line begins, 45 work shafts and 9 prospecting shafts must be sunk for extracting the gas. The total length of shafts will be over 40 kilometres. All along the path of the gas main

dozens of repair shops are to be erected for repairing boring equipment, tools and construction machines; villages will be built for construction workers on the line. A special telephone and telegraph line is to be set up between Saratov and Moscow before the summer months of 1945 to guarantee unbroken communications between all points along the line. At the same time an unpaved road 1800 kilometres long (counting all the branches) is being built along the whole length of the line in order that materials and equipment needed for the construction work may be easily delivered. Later this road will be converted into an automobile highway.

According to the decision of the Soviet Government, all the boring, construction, assembly and operation work is to be finished in a very short period.

One of the distinguishing features of the construction work on this line is that it is being done to a great extent by the general population. Soviet scientists have formed a special committee to aid in the construction of the Saratov-Moscow gas main. This committee is working on a series of theoretical and practical problems connected with the extraction, transporting and rational distribution of the gas.

The population of the regions through which the line passes, are responsible for accomplishing most of the work: digging ditches for the pipes, repairing railway lines leading to the gas main, manufacturing bricks and tools.

For centuries the inhabitants of nearby villages and hamlets have worked only at agriculture, supplying Saratov with vegetables, berries, grain, milk. Now these peasants have become construction workers, assemblymen, operators, thus unexpectedly acquiring new professions.

Institutions in Baku, Kuybishev, Sizran and Ishinbai are preparing skilled workers for the more specialised tasks. Taganrog, Ufa, Molotov, Petro-Uralsk and Buguruslan have delivered hundreds of boring tubes, equipment

for lowering and raising boring tools, steel chisels, electrical equipment, etc.

Some of the best builders of the Moscow subway, and oilworkers from Grozny and Baku have come to take part in the construction of the gas main.

In planning the construction work, first place is given to the hardest and most complicated jobs, such as running the main under riverbeds, lakes and marshes. This work is being done by divers of the *Epron* expedition, who are experienced in work under water. On several sections underground work is being done by construction workers of the Moscow subway. Powerful machines, such as excavators, derricks, stone-crushers, are set up along the entire length of the line, and operate continuously, day and night. The steel pipes have already been delivered and now welders are joining them into lengths of 3—4 pipes to make it easier and quicker to lay them in their permanent place.

Builders have presented their plan, which provides for putting the gas main into operation by 7 November, the 28th anniversary of the October Revolution.

The construction of the gas main is of immense importance for Moscow and represents one of the main factors in the reconstruction of the city. The Moscow subway solves the municipal transportation problem, the Moscow-Volga canal supplies the capital with water and gives it waterways leading to five seas. Saratov gas will solve the fuel problem for Moscow and its suburbs. In spite of a great increase in the production of coal from the Moscow Coal Basin, which is at present one and a half times as great as before the war, in spite of the increase in peat and wood supplies, the fuel problem in Moscow still continues to be serious.

Saratov gas is an excellent, cheap, and high quality fuel, which can be used not only for generating power, but also for technological needs of industries as well. The calorific power of Saratov gas exceeds 8000 calories, i. e. one cubic metre of gas gives as much heat as 3 kilograms of coal from the Moscow Basin or 5 kilograms of wood. By 1946 Moscow will be getting no less than 500 million cubic metres of Saratov gas per year, which corresponds to about one and a half million tons of coal from the Moscow Basin or 400 thousand tons of black mineral oil. Gas will make up about 25—30 per cent of

the total fuel balance of Moscow, and will be used to meet the highly increased fuel demands in the city. When this gas main is completed and put into normal operation, Moscow gas resources will be five times as great as now.

Saratov gas is to be used not only in Moscow. On its way to Moscow it will supply many industrial and municipal establishments, power stations, transportation systems and residential districts in Tambov, Michurinsk and Ryazan.

*

According to calculations made by experienced geologists, the methane resources in the Saratov deposit exceed 100 billion cubic metres. Such a quantity of gas will last for many years even if extracted intensively. Geological prospecting which is still being carried on indicates that these resources will probably be augmented by new finds. The Saratov gas deposit is one of the largest in the world.

For centuries nobody even dreamed of the presence in Saratov of such incalculable quantities of cheap fuel. There were, indeed, phenomena which should have suggested the idea, but nobody paid the proper attention to them.

In 1906 during the sinking of an artesian well on the left bank of the Volga, a sudden "wind" began to blow out of the well shaft. Just at that moment one of the workers lit a cigarette which set fire to the gas. The flaming column rose high up into the sky and was extinguished with great difficulty. A student of the Riga Polytechnical Institute, Melnikov, who happened to be present, had the presence of mind to collect some of the gas for analysis. This analysis showed that the gas was methane, but the only application made of it was by a small glass plant which soon closed down.

Systematic geological research work was carried on here only after the 1917 revolution. Even then it was not natural gas that was sought, but its usual companion—oil. In 1935 the young geologist Helen Kotova discovered signs of oil in the limestone not far from Saratov. Nearly a year later she discovered bromine and iodine in the waters of a local spring, and in 1940 she found oil. In the spring of 1941, prospect boring for oil was begun on the fields of a collective farm near

the village of Yelshanka and quite unexpectedly in September 1941 a gas fountain was struck which gave 700 thousand cubic metres of methane per 24 hours. The gas could not be put to instant use on account of the war.

In the spring of 1942, when the Germans broke through to the Volga, Saratov became one of the most vital sectors of the home front. Its industry was entirely concentrated on supplying the armies defending Stalingrad. This was greatly handicapped by the lack of fuel. The Saratov Power Station had always used Donets coal, and the Donets Basin at that period was occupied by the Germans; delivery of other kinds of fuel, such as oil and wood was also cut off. On 5 September, 1942, the Council of People's Commissars of the U. S. S. R. passed a resolution to immediately begin construction of the Yelshanka-Saratov Gas Main and in two months supply the Saratov Power Station with gas. The problem was a difficult one, since there was no equipment and no place from which to get it. The main had to be built of local materials. Oil mains of local plants were dug up, short length of pipe were welded together, and of these the gas main was constructed.

The task presented by the government was fulfilled, and on 30 October, 1942 the first boiler of the Saratov Power Station was transferred to gas fuel. A few days later a second boiler was connected to the gas line, and then a third. Saratov industry began to work at full swing again and the front began to receive two and three times the amount of ammunition and armaments hitherto received.

While Soviet troops were busy smashing Fieldmarshal Paulus' 6th Army near Stalingrad, our geologists were prospecting for oil and gas some 100 kilometres away and workers and engineers were laying the gas main.

The entire construction of the "Little Gas Main" between Yelshanka and Saratov required the expenditure of 22 million rubles, which by 1 May, 1945 had already been returned as pure profit by the *Saratovgas Trust*. During this period the total amount of gas extracted was about 600 thousand cubic metres, the equivalent of 700 thousand tons of Donets coal or 450 thousand tons of black oil, without the railroad expense of delivering these materials. In 1943 gas represented not more than 20 per cent of the Saratov total fuel balance; in 1944 it reached 30.5 per cent, and in 1945



Electric Welder Baiden at Work on the Gas Main

85 per cent of the total demand for fuel in Saratov and its suburbs was covered by gas.

The construction of a large gas main between Saratov and Moscow is a much more complicated problem. Now, instead of a "small" gas main, only 15—18 kilometres in length, we have to do with an immense enterprise, a complicated engineering job.

Five months were spent in boring shaft No. 12 where gas was found at a depth of 860 metres and gushed forth under a pressure of 84 atmospheres. In September 1944, the borers had scarcely broken through the last hard layer of rock when the gas began to rush out with a loud noise and under tremendous pressure. It hurled the boring equipment and tubes clean out of the shaft along with dirt and rocks. The faint blue column of almost invisible gas rose to a height of 60 metres. It was impossible to speak in the vicinity of the fountain because of the roar of escaping gas,

a sound which could be heard for several kilometres around. The workmen had to stuff their ears with cotton, but even this did not save them from the ceaseless ear-rending noise, until the gas was forced into pipes and sent to its destination. Shaft No. 12 was put under control comparatively quickly—in 5—6 days. A much more difficult problem was met with in shaft No. 15 which took almost four months to get under control. As soon as the gas appeared the hole had to be temporarily plugged up. With great difficulty the shaft was closed with a steel fitting, but the gas began to break through the rock, throwing up dirt and stones within a radius of 15—20 metres of the shaft opening. It was necessary immediately to lower pipes to a depth of 300 metres (down to a firm bed of limestone) and then pump down a cement mixture to fill in the breaks in the rocks. However, several attempts to lower the pipes failed: each time they were thrown back by the powerful jet of gas. Then engineer Kilolsky invented a special *Packer* device for lowering the pipes into the hole. This device was manufactured in a few days by one of the Saratov plants. But when workmen attempted to lower it into the hole, the pressure of the gas forced it too aside. The fight went on continuously for four days and four nights until at last the packer and the tubes were lowered and the cement pumped in. At last side break-ages were tightly plugged up so that the gas stream rose only vertically, and could be securely locked up until the Saratov-Moscow main was ready. Shaft No. 15 is now all ready to supply Moscow with gas.

Experience gained on these early shafts enabled engineers and constructors to "tame" shaft No. 32, one of the largest, in 4 days.

Only four of the smallest of the twenty-four shafts already bored are in operation. The gas yielded by these four shafts is more than enough to supply the demands of Saratov and Kuybishev. The best of the shafts are awaiting the Saratov-Moscow gas main. Among them are Nos. 24 and 32 which will each yield up to 3 million cubic metres of gas per 24 hours.

The flowsheet of the Saratov-Moscow gas main is to be as follows: the gas from several dozen shafts expelled by natural pressure will first be dehydrated and have its pressure lowered from 80—90 atm. to 40—50 atm. then be directed into the gas main, where its

pressure will continue to decrease due to friction against the walls of the pipe. Therefore every 125—150 kilometres along the line of the gas main there will be compressor stations for increasing the pressure of the gas which will arrive in Moscow under a pressure of 50 atm. A high-pressure annular main is being laid around Moscow with 30 distributing stations constructed along its length where the gas pressure will be decreased to 3—5 atm. At this pressure it will be fed to the municipal network, for residential consumption. Local compressors will be set up to prepare the gas for industrial purposes and for the use of plants, factories and municipal establishments, or for intensive burning under steam boilers.

The gas supply beginning with the deposit and ending with the consumer's burner will be carefully regulated by means of automatic control devices and communications. The whole line of the gas main is to be furnished with a system of automatic signalization in case of breakdown, and also with special devices to prevent explosions and fires. Large plants will have automatic gas analysers and recorders for registering pressure.

The Saratov deposit is not only a gas deposit. Gushing forth from the earth under awful pressure, methane carries out with it water and benzine vapours. When these vapours are cooled, the resulting liquid is a mixture of water and pure high quality aviation benzine.

After separating out the benzine from the liquid condensed from the gas of shaft No. 7, the remaining liquid is evaporated to produce salt; for the time being the small-scale apparatus used yields 3 tons of pure common salt per 24 hours. Soon the production of salt is to be increased to 15 tons per 24 hours. Shaft No. 2, located near the village of Kurdum, yields, in addition to gas, pure light oil with a benzine and kerosine content of 50 per cent.

Every 24 hours shaft No. 6 yields over a million cubic metres of mineral water of the Carlsbad type. This water can be used to cure gastric and intestinal ailments. It is transparent and of pleasant taste, contains bromine, iodine and up to 15 per cent of other salts.

Yelshanka gas is used not only for heating boilers: in Saratov dozens of filling stations have been set up to supply automobiles with compressed natural gas, thus economizing on liquid fuel.

It takes only 24 hours to make all the alterations necessary in an automobile so that it can work on gas, and the job can be done easily in any normally equipped garage. As a rule, automobiles running on gas can cover three times the mileage of those running on gasoline before requiring overhauling.

The existence of large stores of natural gas offers grounds for founding or expanding many industries including the manufacture of acetylene, synthetic rubber, artificial silk, paints, plastic materials, acetone and varnishes, as well as medicines such as chloroform, pyramidon and aspirin. Already a plant is being built in Saratov, which will prepare raw materials for synthetic rubber plants.

The Saratov-Moscow gas main is the first step in establishing an extensive gas industry in the U. S. S. R. Over 200 deposits of natural gas have been discovered on the territory of the Soviet Union in the vicinity of the Volga;

of the city of Novorossiysk; in the Zaporozhye District; near Melitopole; and in the foothills of the Karpatian Mts.—in the Drogobich, Stanislav and Lvov Districts of the Ukraine. Until the present the only deposit in the North Caucasus of commercial importance was that which supplied the *Dagestanskyye Ogni* Power Station with fuel. Not long before the war, extraction and application of natural gas was begun on the Kerch Peninsula. Within the next year and a half Kiev, the capital of the Ukraine, will be gasified. A gas main 520 km long is being planned between Dashava (Western Ukraine) and Kiev. The completion of these two gas mains (Saratov-Moscow and Dashava-Kiev) will lead to the development of other deposits discovered in the U. S. S. R. which has the greatest geological deposits of natural gas in Europe and the second greatest in the world, giving place only to the U. S. A.

FROM THE HISTORY OF RUSSIAN CULTURE

MICHURIN'S HERITAGE

(The Tenth Anniversary of the Death of *I. Michurin*)

By Prof. *Paul N. Yakovlev*

Stalin Prize Winner, Manager of the Michurin Nursery Gardens

TEN YEARS ago, on 7 June 1935, there died one of the most prominent Russian scientists, member of the Academy of Sciences, Ivan Vladimirovich Michurin. The life of this talented Russian genius, formerly an unknown gardener who reached in time the heights of scientific fame, was full of creative impulse, unwavering energy in overcoming difficulties and supreme fidelity in serving his country and his people.

The Soviet system offered endless opportunities for the creative achievements of I. V. Michurin. His name is now known the world over. Michurin is an inventor and thinker who has been acknowledged by the whole of progressive mankind. He was especially popular and loved in the Soviet Union, where every schoolboy knows of his remarkable work. The former city of Kozlov, where Michurin worked all his life, now bears his name.

V. I. Lenin was of a very high opinion of Michurin. On 18 February 1922 the Soviet of People's Commissars sent the following telegram signed by Lenin: "Experiments on production of new cultivated plants very important for state send report on experiments and works of Michurin immediately to President of Soviet of People's Commissars comrade Lenin."

On 22 September 1934, J. Stalin sent the Russian selectionist the following greetings by telegram: "I congratulate you with all my heart, Ivan Vladimirovich, on the sixtieth anniversary of the launching of your career; a career which has brought glory to

your country. I wish you the best of health and new achievements in the transformation of fruit-farming.

With best wishes,

J. Stalin.

What is it that has made I. Michurin so famous? Why is his name so beloved and popular throughout the whole Soviet Nation?

Michurin's merits are innumerable. As a result of sixty years' intensive work he moved the growth boundaries of such southern cultures as apricots, grapes, cherries, almonds, walnuts, winter pears etc., hundreds of kilometres to the north, displaying thereby hitherto unprecedented daring. Before Michurin the middle zone of Russia knew no such cultures. Now they grow splendidly not only in the middle zone of the country, but quite often in the severe climate of the Urals and of Siberia.

Hundreds of thousands of plants of all kinds passed through Michurin's hands. In order to produce new species he made use of plants from all over the world: Pamir, Turkmenia, Kazakhstan, Canada, the U. S. A., Mongolia, Northern China, the Caucasus, Siberia, France, Belgium, Turkey. By crossing a wild species of grapes from Canada and the Ussury District with varieties from Southern France and America Michurin produced several excellent new varieties of grapes—*Northern Black*, *Russian Concord*, *Metallic*, etc. Three varieties are frost-hardy and have an excellent flavor.

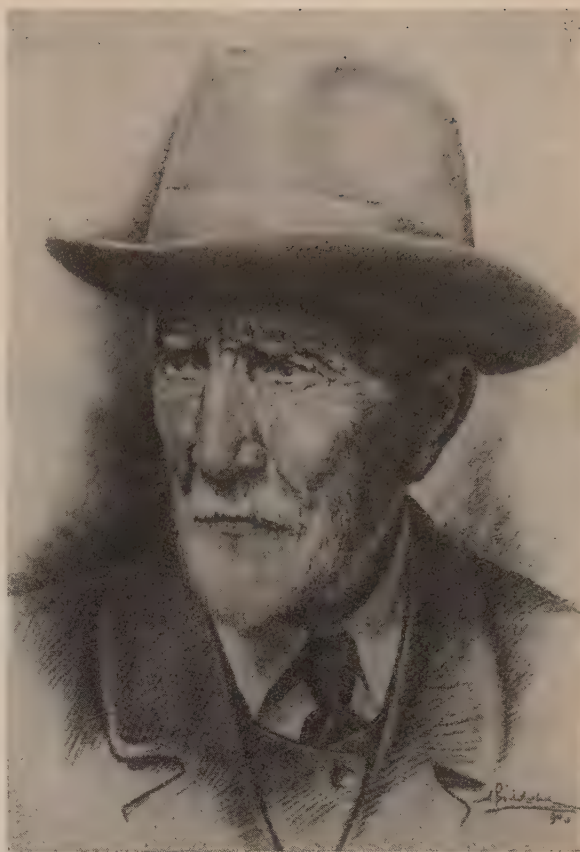
In the same manner Michurin produced his famous pears (*Michurin Winter Beurre*), new varieties of cherries (*Plodorodnaya* [*Fruitful*], *Krassa Severa* [*Northern Beauty*] etc.) and some excellent varieties of plums. Michurin varieties of apple trees are frost-hardy, fruitful and quickripening.

During his sixty years of scientific research work Michurin developed over 350 new varieties of various fruitbearing plants. More than 50 of them are already being raised on a mass scale on collective and Soviet farms and in the private orchards of the inhabitants of towns and villages. But Michurin's service to his country consisted not only of practical achievements. He created a systematized science of agrobiolgy which gives specialists, scientific workers and experimenters at collective farms a powerful weapon for transforming nature. Michurin developed and expanded Darwin's theory of heredity and evolution in plant organisms, layed out new scientific pathways for biology and agriculture. He explained the cause of the variable nature of heredity, showed under the action of which material forces change occurs, proved that by controlling and modifying the conditions of life, one can transform the very nature of an organism.

In one of his works Michurin indicated that by bad cultivation we can get the very wildest species of plant from the very best cultured hybrid, and, on the contrary by applying the proper methods on a cultured hybrid seedling, bearing undesirable latent qualities, we can lessen the development of these bad qualities and sometimes even do away with them altogether, thus producing a new good variety. By using Michurin's methods of hybridization (crossing) and mentor (grafting a slip of another variety to a young hybrid seedling in order to improve its qualities) not only selectionists, but collective farm gardeners as well can create new varieties of plants.

Michurin's teaching is Darwinism in agrobiolgy. In the Soviet Union Michurin's theory is universally acknowledged. His methods serve as a scientific guide not only in fruit farming, but also in seed growing, selection and genetics of all agricultural cultures.

In his science of vegetative hybridization, which is now being developed and expanded by his talented follower G. Lysenko, Michurin dealt a decisive blow to the metaphysical



Ivan Michurin

views of the geneticists Mendel and Morgan.

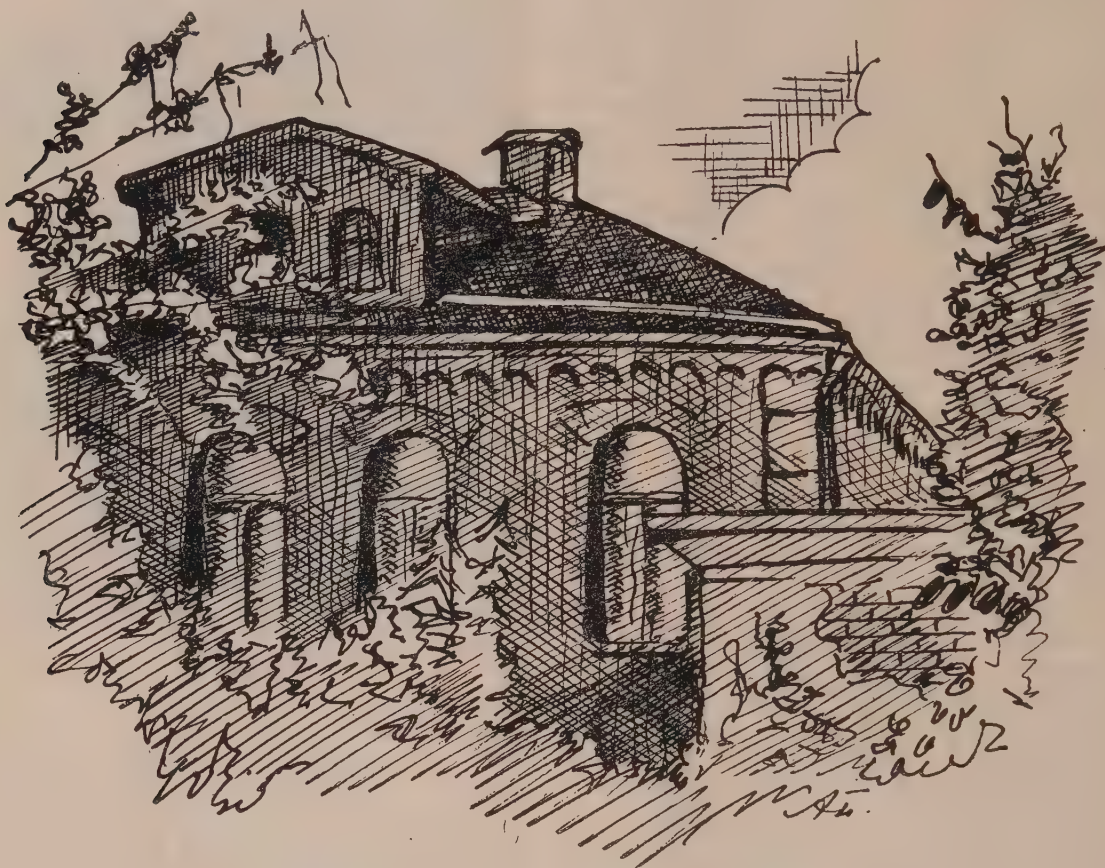
Mendelianism and Morganism define heredity not as a property of live tissue, but as a special substance, entirely distinct from that tissue. According to this theory heredity is peculiar only or mainly to chromosomes—i. e. to the redlike bodies in the nucleus of the cell. Only the changes in the chromosomes, in this "hereditary" substance can result in changes in the nature of the organism. But changes "in the body" do not affect heredity. Therefore, changes in life conditions can affect only the body of the organism, but not its nature, nor its heredity. Hence it follows that the nature of organisms cannot be changed by changing the life conditions of plants or animals.

Michurin and Lysenko teach that heredity changes in a live creature arise and develop in the process of its development under the

action of its environment. Changes in the development of the organism brought about as a result of changes in its life conditions are the basis for changing the heredity in the descendants of the organism in such a manner as to meet the demands of practical experience. Michurin's motto always was: "We

nezh, Orlov and other districts from the Michurin Nurseries. The orchards of the Kuybyshev, Tula, Ryazan and other districts were inspected and practical aid was given to the gardeners there.

Since the Michurin Nurseries became state property (in 1919) over 800 species of plants



The House in Which Michurin Lived and Died

cannot wait for nature to grant us favours: it is our business to take them from her."

The research institutes founded by Michurin continue his tradition of retaining close contact with the people. Every year they receive thousands of letters from all parts of the country, asking for advice in fruit farming.

During the war the Michurin Research Institutes continued their training of selectionists. From the fall of 1943 over half a million seedlings of Michurin varieties of fruit plants were delivered to the Moscow, Tambov, Voro-

have been accumulated there, brought by Michurin from Asia, America and Europe during the later years of his life. At present a single experimental base of the Michurin Research Institute in the town of Michurin is studying and testing over 1500 fruitbearing plants.

Michurin's followers are persistently and systematically reproducing all of Michurin's new varieties. During a period of twenty years these varieties have been planted over an area covering more than forty thousand hectares.

In 1944 the selectional fund of fruit-bearing plants being tested in various regions of the U. S. S. R. (Siberia, the Far East, the Urals, and the European U. S. S. R.) by experimental stations belonging to the Research Institute of Fruit Farming in Michurinsk consisted of about 520,000 hybrids of various plants. Over 40 valuable varieties of apple trees, pear-trees and other seed cultures, varieties of plums, apricots and other drupaceous fruits, over 100 varieties of berries have already been developed. Hundreds of thousands of hybrid plants are being cultivated at the experimental stations of the Institute, of which 143,000 are being cultivated in the Altai Mts., 67,000 in Novosibirsk, 35,000 in Krasnoyarsk, 21,000 in Minusinsk. All this represents inexhaustible material for carrying on work according to Michurin's methods, for enriching and extending the orchards of the Soviet Union and for restoring the wealth of plant growth destroyed in many locations by the fascist barbarians.

Michurin's establishments are hard at work. Their main efforts are concentrated upon the development of new varieties of apple-trees exceeding standard quality. In this respect we must mention the successful work done at the Central Laboratory of Genetics in Michurinsk by Prof. Sergei F. Chernenko, who in the course of the past few years has developed several excellent new varieties of apples. Much work is also being done in the field of developing new varieties of pears, plums, apricots, grapes, gooseberries, raspberries, strawberries, walnuts, almonds, etc. The Central Laboratory of Genetics in Michurinsk has seven hectares of commercial vineyards.

The specialist in wine-making Ivan V. Potapenko, who was invited in 1933 to work at the Central Laboratory of Genetics by Michurin himself, has developed several excellent new varieties of grapes, which flourish in the climate of the Tambov District. A variety developed by Potapenko, called *Hybrid Black* is an outstanding early ripening variety.

Varieties of grape developed by Michurin are already growing successfully at more than 500 locations in the U. S. S. R. In 1944 the Soviet Government passed a resolution to expand commercial viticulture to the middle zone of the Soviet Union. Near Moscow several large vineyards are to be organized, which in a few years will be able to com-

pletely meet the demands of the capital for fresh grapes and wines of their own make.

This is one of the outstanding results of Michurin's many years effort to develop a northern variety of grape.

Unprecedented achievements have been made in far removed intergenal hybridization. Dur-



Vineyard at the Michurin Central Laboratory of Genetics

ing the war, for the first time in world practice such fruitbearing hybrids have been produced in Michurinsk as hybrids of apple and pear trees (by T. A. Gorshkova), plum and peach (by V. N. Yakovlev), cherry and plum, red and black currants.

Michurin wanted us to keep on moving fruit-farming ever northwards and eastwards. A conference on fruit-farming held in 1944 showed that his desire is being realised. Ten years ago there were almost no fruit plantations in Siberia. Now there are large Siberian orchards producing both Michurin's and local varieties which have been developed by experimental stations. During the past few years thirty-five varieties of apple-trees, nine varieties of gooseberries, and one variety of grape have been introduced in the Chelyabinsk District.

The Soviet Government pays great attention to the Michurinsk educational and research institutes. That is why their results are so successful and the scope of the work in this field so vast. Since Michurin's death his work has been continued not only by great scientists in selection and by various institutes, but also by thousands of small laboratories set up in villages throughout the country. The huge

army of Michurin experimenters form the vanguard of socialist agriculture.

The inhabitants of Novosibirsk may well be proud of their local varieties of apples. In the city's orchards such trees as *Purpurny Ranet*, *Barkhatny Anisik*, *Zholty Naliv*, *Kitaika Anisovaya* bear great quantities of fruit. The Michurin varieties of apples such as *Pepin Shafaranovy*, *Anis Aly* etc. have proved adaptable to the climate of Novosibirsk. None of these trees are affected by cruel frosts. They bear excellent fruit reaching 300—500 gr. in weight, while the yield of one eight-year old tree is as much as fifty kilograms a year.

This is all the result of persistent labour on the part of the local Michurin Society. It consists of over a thousand members, and they do great work in developing local varieties of fruit-bearing plants and in distributing them

in neighbouring regions. Yakov Safonov, an old locomotive engineer, now on pension, has already developed several varieties of apples capable of weathering the climate of Novosibirsk. In 1944 the Society's orchard extended over 25 hectares. Thirty thousand saplings have already been distributed by the nurseries, and new nurseries are being developed in the city and neighbouring regions.

Thus, thousands of miles away from Michurinsk, new centres of scientific fruit-farming are ever arising and developing, and the young shoots of the science of selection are penetrating into the most remote corners of the vast territory of the U. S. S. R.

Michurin's heritage is in reliable hands. As it develops it will see the flourishing of unprecedented plants on the earth and will cover it with blossoming orchards.



A View of Michurin Nursery. A Drawing Pencil by A. Potapenko

SERGE TANEYEV

On the Thirtieth Anniversary of his Death

By Igor Glebov

1

SERGE TANEYEV was a great Russian musician whose life and work arouse profound admiration and respect. His music bears the imprint of intellectual concentration and deep adherence to principle. His path in life was the path of one who seeks the truth. In his music every thought is given the form of a complete, carefully considered utterance. Behind this severe form which, one would think, might sweep aside the composer's emotional "I", the attentive and sensitive listener cannot help but note that it was not the chill indifference of a pedantic recluse which was the guiding spirit in the composition of such intricate musical conceptions but vital creative thought and the treasures that lie concealed within a great heart.

Only a few of Taneyev's contemporaries really appreciated the spiritual beauty of his music and his ideas.

Taneyev was never one to stress the emotional aspect of music as an aim in itself. He felt no inclination to do this. He was well aware that there was no music outside the human heart, but he was also aware that a purely naturalistic expression of emotional experiences is one thing and the expression of feelings through art, the depiction of the individual's spiritual world by the composer, quite another. In this respect Taneyev's modesty, spiritual chastity and penetrating intellect merged to form a harmonious unity. The scope of ideas and images engendered by this unity was truly gigantic. The deep intellectual content which frightened so many of his contemporaries and the completeness of Taneyev's musical reasoning were by no means the result of rhetoric, but of a specific process of development in which the scholastic dogmas of musical syntax were transformed into the laws of musical logic. In rising to the heights of revealing human thought in music, these dogmas lost nothing more than their scholas-

tic significance. And indeed, in a number of Taneyev's works the music is so intellectual that it approaches pure philosophy.

2

The scope of Taneyev's creative work was very broad. The only purely symphonic work to be published during his lifetime was his symphony in C minor. It is curious to note that the key of C occupies a particular place in Taneyev's work. His music written in C major always creates an impression of lofty purity and clarity as though the human spirit were trying to soar beyond the confines of our ordinary "wordly" horizon and embody in sound the beauty and greatness of the human mind.

Orestes is a Russian opera forgotten by all theatres, one that instead of abstract symbols is filled with a vital, spontaneous sense of the justice and heroic majesty of human ideas. In embodying his conceptions of classical tragedy Taneyev created music that was indeed far from the everyday world, but his purpose was not to cut himself aloof from people but to listen to the impassioned, powerful intonations of the heroes of the ancient myths from the great authors of tragedy. It is in these tragedies that the innate volitional nature of man is revealed in order to point the way to man-made conceptions of supreme justice. There is a marvelously beautiful entre'acte in this opera, entirely symphonic in its musical structure. It seems to reflect the basic idea of all Russian art, namely, that there is no beauty without a guiding ethical principle.

In this opera—*Orestes*—Taneyev confronted the theatre with a problem that demanded courage and initiative to solve. One may argue about the value of various operatic genres, about how serious or comprehensible opera music should be or about the extent to which symphonic or vocal elements should predominate but there is one thing that cannot be

denied—that the dramatic action should reflect ethical problems.

It must be borne in mind that this opera was written at the time when Leo Tolstoy's mighty voice was resounding throughout the world—"People, search your consciences!" The fact that Taneyev expressed this idea in musical images but without the meek submissiveness of a Tolstoyan only puts him on a higher level, revealing him as an artist of intelligence, with a strict regard for the ethical, austere-emotional content of art. In *Orestes* and in all his music, for that matter, Taneyev has no desire to astonish his listeners with original and new harmonic effects. If such arise, they are not inserted artificially for their own sakes but take form naturally and logically.

The classical rule of "know thyself" is evident in Taneyev's work as it is in that of many Russian artists. The wisdom of antiquity is found not only in his *Orestes* and not only in the themes he treats. It is hard to find any definite, tangible proof of its presence, but self-knowledge can be felt in Taneyev's music wherever one feels the presence of a human heart. This is particularly apparent in the singular structure and tonality of his music. It never falls to the level of naturalistic "groaning and moaning." Taneyev is able to put great feeling into his music and illuminate the labyrinth of intricate polyphonic constructions with such a tender and at the same time noble spirit that you feel behind all these seeming machinations the simple and serene smile of a man who loves nature and all her living creatures.

Taneyev keeps this tone of simple-hearted modesty, free of the slightest touch of arrogance, throughout all his music. This is, perhaps, the reason why there is no professional manner or other obtrusive element in his music, despite its marvelous technical mastery.

3

The cycle of string quartets from the first to the sixth form a state within a state, so to speak, in the vast domain of Taneyev's works.

Taneyev seems to be testing his own heart stage by stage. What was valuable in life, what was worth recording in the lasting forms of one's own art? And indeed, no matter how perfect the form of the quartets or their se-

parate movements, one ever bears the human "why and wherefore?" which has been ever repeated since Schumann.

It may be that in his stupendous sixth quartet—the "book of books" of Russian quartet music—Taneyev, going over in his mind all his instrumental chamber compositions, intended to create a treasure chest in which to preserve for all time the most enduring, most mature ideas about everything he had experienced and contemplated during his life.

4

"What have Russian composers to do?" was the question which brought the young Taneyev into contact with the dreams that stirred Glinka not long before the latter's death.

"The forms of West European music (sonatas, symphonies, etc.) emerged gradually. They developed from the fugue which in its turn evolved from the contrapuntal forms of folk and church melodies. No form developed accidentally, all forms of necessity evolved from preceding ones. It can therefore be said that folk songs and church melodies lie at the basis of all European music. For several centuries people worked over these forms and the result of their labours is to be seen in modern forms of Western European music. Thus folk melodies contained in *potentia* all of modern European music. Only human intelligence was needed to convert them into rich forms of music. The brain is a force. If force is applied to anything a result is obtained which on the one hand derives from the qualities of the force applied, and on the other from the qualities of the object to which the force is applied.

"When Russian musicians study Western European music they encounter ready-made complete musical forms. They either compose in the European style or try to make the Russian song fit into European forms, forgetting that the Russian song is something external and alien to European music. The form of every composition is closely bound up with the material of which it is made. The form of a building will differ depending on whether the material used is wood or stone. Although each kind of material contains in *potentia* an infinite number of forms, it also implies necessary limitations to all these forms.

"Russian musicians are like an architect who upon seeing a log house would begin to build something similar out of stone trying to lay the stones in such a way as to achieve the same hollows and curves. It is clear that before long the architect would realize that nothing could come of his attempt.

"Russian musicians also realise this instinctively... Nor can it be otherwise. European forms are alien to us. We have none of our own. We have no national music. Chai-kovsky, the finest Russian, wrote a text-book of harmony, but what harmony? European. We have no harmonic system of our own...

"The task of every Russian musician is to promote the creation of national music. The history of West European music offers us the answer to the question: what must be done to achieve this? The same mental effort as was applied to the song of West European peoples must be applied to the Russian song and only then will we have a national music...

"Suppose we learn all there is to be learned from the old contrapuntists and undertake this difficult but very glorious task. Who knows, perhaps we shall bequeath the next generation new forms, new music. Who knows, perhaps in some scores of years, perhaps at the beginning of the next century, Russian forms will appear. It does not matter when they appear but that they must appear..."

It is difficult to believe that all this (and much more in the same vein) was written by Serge Taneyev in February 1879 in Moscow. It is taken from one of his notebooks¹. I have assumed the liberty of quoting at such length precisely because in the middle of the 1850's Glinka spoke of the same thing, save that he did it with the brevity peculiar to his utterances. Some twenty years after him Taneyev voiced the ideas which were to become so characteristic of the whole subsequent period. It is hardly probable that in stating his conclusions Taneyev knew that Glinka had expressed kindred thoughts in his time... This goes to show that such ideas were ripening in the minds of Russian musicians and found expression in the intellectualism of Glinka. Their development was merely checked for some time.

¹ Published in *Serge Taneyev. Personality, Works and Documents*, Moscow, 1925, pp. 73—74.



Sergei Taneyev

5

Glinka and Taneyev, both profoundly Russian in their make-up, were not content with narrow professional limits. Endowed with a sensitive ear for intonation, Glinka developed this capacity by delving deeper and deeper into the sources of national music. Glinka also possessed a perfect command of the technique of his time and realized that as taste became more and more refined, feeling became more and more fatigued.

After he had turned to sources of Spanish music and had drunk deep of its wonderful rhythms and its primitive melodies, Glinka sought inspiration ever more frequently in European music, not in light, entertaining genres, but in austere exalted forms. Upon closer examination, it gradually becomes clear that Glinka was interested in polyphony as the most tangible sphere of thought in music. He was intuitively afraid of a return to

individualism and after his wonderful epic songs about heroic deeds (*Susanin* and *Ruslan*) he could no longer return to the petty everyday art of the bourgeois world.

He delved deeper and deeper into the old art of polyphony. His purpose here was the same as it had been in the case of folk music. He did not seek music on any particular subject but music which had been created by millions of people.

In short, Glinka sought the roots of polyphony and the sources of all European music. At the same time he hoped to find a basis in the austere simplicity and melodiousness of Russian cult songs on which to develop the severe new style of which he dreamed.

While still a young man Taneyev reached the horizons which a study of polyphony opens to musicians and gradually became more and more interested in the remote past of polyphonic music, dreaming, as did Glinka, of finding a reasonable basis for further development. Like Glinka, he also thought to fuse the native polyphonic qualities of Russian folk music with the great universal polyphony of Western European music.

Thus Taneyev combined the idea of the ethical principal in art, which is an old one in Russian esthetics, with Russian ideas of universal art. These ideas are evident in Glinka's quest for the foundations of music in earliest European musical forms.

For Taneyev these sources, i. e. the sphere of polyphonic thought, did not create any impression of having become atrophied with age. It was not at all a matter of restoring certain compositions of remote epochs which seemed to people of the end of the nineteenth and the beginning of the twentieth century to have lost all the charm of vital emotion with the passing of years. Taneyev strove to divine the laws governing universal polyphonic thought as a beneficial motivating force which could invigorate and strengthen musical structure and forms which were growing ever weaker.

And indeed, what is polyphony in its true sense? It is by no means an outlived historical stage in the development of music nor a course in musical archeology nor a narrow practical manual of methods. Figuratively speaking, polyphony is the blood that courses through the veins of music, without which music, despite the most exquisite harmonies, either turns into a skeleton or simply falls to pieces.

Both in his music and his research Taneyev proved what broad perspectives open out before music if the composer masters the art of polyphony as something inherent to music, as one of the treasures won by mankind in its struggle for forms of communion through sound. The music of the twentieth century could not and should not have learned the routine of polyphony by mechanically copying the rules of the old theoreticians and contrapuntists. On the contrary, the laws which Taneyev arrived at by the method of research provided musicians with a superb instrument with which to top still unused reserves of music, thus opening up new horizons to musicians which would conform to the flexible, nervously receptive organism of the modern man, particularly in the field of symphony music.

The true significance of Taneyev's great life work, which is still far from realised in all its breadth and depth, lies in his discovery of the laws of language in polyphony and in its rich resources and not at all in an invitation to return to primitive forms.

The most cursory observation of the growth and development of Taneyev's music (compare the distance that separates the first and the last cantata or the first string ensemble and the sixth quartet or the string ensemble and those for the piano) is enough to convince one that this growth was not a quantitative one. The development of Taneyev's music was a qualitative one—newer and newer horizons opened out before the composer's creative mind; there was increasing flexibility, fulness and freedom of expression.

It was as though Taneyev held every new idea that came to him in his hands, working on it from different angles and in various aspects, observing what was valuable and what was transitory in order to be able finally to assert that which was most essential and convincing.

This is how the best pages of Taneyev's developments are to be understood. This is probably why he was so successful with the *Adagio Expressivo* of the second quartet, the *Adagio* of the *C Minor Symphony*, the *Adagio Serioso* of the sixth quartet, the *Largo* of the piano quartet, the fifth quartet from the cantata *On Reading a Psalm* etc.

To elaborate music like a deep thought, is an art that not all are able to master and one which is almost lost today. It was only in Taneyev that classical Russian music found

a worthy representative of the epoch of sage musical philosophers. I venture to say that the present renaissance beginning in chamber and symphony music to express ideas on a large scale and with calm, unhurried reflection, i. e., the appearance of protracted spiritual states in music, owes much to Taneyev's efforts.

6

There is still another characteristic of Taneyev's music which makes him kin with the great masters of the classical period in European music. His art is profoundly moving and impels one to think about many things while it is itself calm and makes no effort to amuse or entertain. There is in it the serenity and calm of a strong character under perfect control. Does that mean that there is no suffering in Taneyev's music or that his heart beats quietly? No, it does not.

Let us penetrate, insofar as is possible, into the more intimate world of Taneyev's reflections—his songs. In them he seems to come nearer to the spontaneous emotions of current life than in any of his other compositions. Here, too, of course his spiritual modesty impels him not to scatter his feelings and to retain the strength of the impression. The core of Taneyev's emotions is evident in these songs, however. I do not want to repeat here what I wrote long ago about Taneyev's songs, when I first succumbed to the charm of their restrained and profound lyricism. What power of will one must have developed in oneself and how one must admire art to be able to express with such perfect compactness the intense feelings of one's innermost nature, to express them as an artistically conceived impression, in all truth and at the same time on a lofty contemplative level.

Such a style, of course, has several stages of development. Compare, for instance, *My Heart Beats Unquietly*, *In Invisible Smoke*, or *The Mask with Menuet* and you have Taneyev the lyricist. At the same time one cannot help but notice that there is one essential singularity in this type of song lyric—in contrast to the tendency common to most Russian song writers, to obscure the musical image with overemphasised dramatic effects or literary and poetic ideas, Taneyev subordinates all these elements to the idea of pure musicality. For him music is not only an integral com-

ponent of a song as a whole but an esthetically independent factor, absorbing the intonation and rhythm of the words and forming the unity of art.

A characteristic of Taneyev's creative work was his concern in defending the interests of music as a fully qualified medium for the intellectual communion of mental images. A musical idea, its development as a self-sufficient value—not in the abstract sense, independent of related arts—but as possessing full rights to an independent reflection of reality was an indisputable, entirely concrete phenomenon requiring no explanation or translation.

By his unquestioned advocacy of self-expression in music Taneyev raised the appreciation of musical technique to higher levels. In his works it acquired a significance that went far beyond the confines of narrow professional skill. In addition to practical hints on how to build music, it contained logical research into the elements of music as a process of thinking. This was what prompted him to write his great work *Podvizhnoy Kontrapunkt strogovogo pisjma* (*Imitative Counterpoint in Strict Style*). It was to have been followed by an elaborated theory of the canon, left unfinished at Taneyev's death.

When one examines the list of Taneyev's unpublished works—146 compositions not counting the plans for operas that were never written and his very interesting notebooks—one is amazed at the force of his intellect and the energy of his reasoning.

"The existence of such a large number of unpublished works is to be explained chiefly by Taneyev's exacting demands on himself, demands which sometimes went to the extreme. It was as a result of this attitude that he was so strict in his selection of the works which he considered worthy of publication, he began to publish his music comparatively late in life, ten years after his graduation from the Moscow Conservatory in 1875. During that time he accomplished a tremendous amount of works in perfecting his technique of composing, trying his hand at practically every genre of music. Most of his compositions of this early period never saw the light because of a lack of confidence in his own talent and because, little known and little performed as his music was. He had still no regular publishers¹."

¹ *Serge Taneyev. Personality, Works and Documents.* Moscow, 1925, p. 109.

Comparing the unpublished with the published compositions one realises how much of value there is in the vast amount of manuscript material left by Taneyev.

7

Taneyev's striving after perfection, however, did not come easy. His capacity for work was his most distinguishing characteristic after his great talent. He could discipline himself in his work and this was one of the main factors which enabled him to accomplish as much as he did. There was no need for him to put on the airs of a pedantic, conceited scholar. Any sort of hypocrisy was utterly alien to his nature. A cheerful master of his thoughts, his work and his leisure, his tenor of life was orderly and smooth, with no confusion or appearance of "being busy."

He was as efficient in his teaching and his concert performances as in his work as composer, researcher and an interested observer of Moscow musical life.

Taneyev and Chaikovsky, pupil and teacher, both shared a respect for hard work, for discipline and fundamental rules of work. They both had a perfect command of what may be called the "technique of one's own imagination" and the precision of creative thought, closely linked with their customary manner of work. It may be that Chaikovsky, as the more impulsive of the two, yielded to a nervous haste in his work under the pressure of the musical ideas that exerted a greater pressure on his mind than on the mind of the more rational Taneyev. In this connection it is interesting to compare Taneyev's method of work on his only published symphony and on his opera *Orestes* with Chaikovsky's method in composing *The Sorceress*, for instance.

Their correspondence is a priceless document testifying to the creative exchange of thoughts between two great Russian musicians—diverse in character but united by their utter devotion to music. In both of them the "Mozartian" decidedly predominated over the "Salierian" qualities. This was not difficult to understand. The cult of Mozart lived on in both Chaikovsky and Taneyev, not as artificial stylisation but as true admiration for music full of reason, light and joy.

Chaikovsky's ideas and intonations are of

course apparent in Taneyev's compositions, but not in a fixed and rigid form. To put it briefly, there is in Taneyev's music a certain process of poetisation, illumination and philosophical crystallisation proportional to the direct impressions stemming from Chaikovsky's lyrical emotion. While it was impossible to resist them, it was quite natural to develop them toward higher levels of humaneness. Thus the friendship of Chaikovsky and Taneyev, like the friendship of Schiller and Goethe, was mutually beneficial.

With Taneyev's inclination for reflection the spirit of Chaikovsky's music was to him what Beatrice was to Dante. But the question remains—would Taneyev's ideas have become a Virgil for Chaikovsky in his creative roving? One of these friends completed his sixth symphony and the other—a cantata which carried the human mind to distant spaces which were as yet unconquered. As Taneyev's creative work approached the writing of his last cantata, the more resilient and tempered its structure, its intonations and imagery became. It was precisely polyphony that lent vigour and beauty to the symphonic development. The sweeping horizons opening up before Taneyev's creative possibilities gladdened the heart, made his ideas younger and fresher.

It seems to me that the great forward strides being made in Soviet symphonic music today are closely linked with Taneyev's symphony music. I have not in mind, of course, the idea of literal imitation, but the influence Taneyev's music has had upon individual musicians and upon Moscow musical life for the past few decades. This musical life has beyond a doubt been warmed by the rays of Taneyev's genius. His music is of an entirely different kind and structure than the symphonic music of Glazunov, who had reason to feel a deep attraction for Taneyev's polyphonism and expressed this feeling in the words, "There is more air and space in this music¹." It was these qualities that influenced the intensive development of modern Soviet music of the Moscow school, which has produced some of the finest symphonists in the Soviet Union.

¹ Borrowing Shelley's poetical idea, I should like to add that in Taneyev's work one hears the hymn of intellectual beauty, the beauty of musical development and of the plastic forms of music.

ART AND LITERATURE

NEW BOOKS

THE AUTHORS of the best recent works of Soviet literature have attempted to show how the war has brought intellectual and ethical maturity to Soviet people. Maxim Gorky wrote that the duty of Soviet Art was to show "the member of the new society;" to reveal his qualities, to make him feel that he "is simple and understandable, as well as great," and in this way to promote the development of the better sides of his character.

The books for young people published during the past few months bear witness to the success achieved in this respect by Soviet literature.

The first volume of the novel *Two Captains* by Benjamin Kaverin appeared a few months before the war broke out. The second—just before its victorious end. Thus, the heroes of the novel passed together with the author from times of peace to times of war. The plot of the novel, its subject and the characters of its heroes were put to a severe test—as to whether the novelist in beginning his work had foreseen the trend of events correctly, whether he understood what traits of character time would require of the people he had chosen as the heroes of his novel, and how these traits would be expressed in time of war.

The hero of the novel is a Soviet youth, Alexander Grigoryev by name, who finds himself connected with the fate of the lost Geographical Expedition of Captain Tatarinov. This expedition had left for the Arctic before World War I. Its purpose was to follow the North Sea Route, but all its members had perished in spite of their heroism. Alexander Grigoryev, a young man who grew up in Soviet times, decided to continue the work begun by Captain Tatarinov. He proved

the falseness of the rumours which tended to discredit the expedition and he solved the mystery of its fate. But it is the character of Alexander Grigoryev rather than his adventures which represents the greatest interest of this novel. Kaverin presents a fascinating portrait of a daring captain, a flier and explorer. Alexander Grigoryev is a robust, wholehearted man with a strong and noble spirit. There is nothing artificial about him; this is by no means a "positive" text-book hero, designed artificially after a ready-made model. The very force of Grigoryev's character lies in its lifelikeness and truthfulness; it is, so to speak, a compound of the best traits characterizing people brought up during the years of Soviet Power. During the war Grigoryev displays those same spiritual qualities which in peace times had led him to exploration and travel. When his country fell under the shadow of a great danger, these qualities manifested themselves in battle, helping him to become a fearless warrior.

The story of the second volume of *Two Captains* is told by Kate, the daughter of Captain Tatarinov and the wife of Captain Grigoryev. This gives Kaverin a chance to show his hero in a new light: as seen through the eyes of the woman who loves him. At the same time the author gives a full picture of the inner world of Kate, the courageous wife of this fighter-flier. Her whole life passes in partings and meetings, in breathless expectation of news about her husband.

In this novel Kaverin has mastered the secret of natural, "free-running" narrative. In his novel the people are alive; they change before one's very eyes, becoming ever more grown-up, ever more mature. And the circumstances in which they live also keep

changing: grief is supplanted by joy, the war enters their lives, the personal fate of the characters is bound up with the historical destiny, and it seems that the only motive force in the book is time. But this impression is misleading: the whole novel is full of tense drama—both the general trend of events and the separate fate of each of the heroes contains its internal dynamics.

In Russian literature such an organic interlacing of lofty ideas and dramatic tenseness of narrative was achieved best of all by Dostoyevsky; in English literature by Dickens. And it was precisely these great masters that Kaverin chose as his teachers. From them he learns to bring out lofty ideas in his stories through complex and thrilling plots.

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Valentine Katayev's *The Regiment's Son* does not attempt to deal with many characters. No important problems are treated in it, nor does it cover extensive time or space. Its plot is simple. Nevertheless, the story tells of serious and good things, and is full of poetic charm.

A scouting expedition of Soviet artillerymen come across a little boy asleep in the woods. The child was one of those many unfortunate children whom the German invaders had made orphans. The soldiers bring the boy to their detachment, and after a number of adventures Vanya Solntsev becomes the "regiment's son." The battery commander, Captain Yenakiyev, whose child was killed by a German bomb at the very beginning of the war, intends to adopt Vanya but perishes in one of the battles against the fascists. In accordance with the captain's last wish, the Regiment Commander sends the boy to a Suvorov School, and this is the end of the book.

In our brief account of the plot, however, we have in no way shown those artistic features which give the story interest. Katayev has a gift for telling the most simple and even dry things in so entertaining, witty and poetic a manner, that the reader is won by the charm and attraction of these things. His skill allows Katayev to bring to reveal many of the mysteries of the art of war, to make subjects of a strictly specialized nature popular and comprehensible to everyone. This is so because the writer is concerned primarily with the people in the military service. It is live Soviet

officers and soldiers who impart meaning to the dry paragraphs of military regulations, to all regulational terms and expressions. Just after Vanya has been found and brought to the camp, Gorbunov, one of the scouts, while treating the boy to a cup of tea, promises him: "Captain Yenakiyev will give an order to have you enlisted, see? And from then on you'll be in on all the rations: ammunition, provisions, and cash." And these words, whose meaning Vanya only partly understood, seemed magic words to him, just as everything about him seemed magic. "It was all like in a fairy tale," writes Katayev about the impressions of his little hero: the tent, bright with sunshine, the rumble of battle nearby, the good giants, throwing handfuls of sugar before him, the promise of "all the rations: ammunition, provisions, and cash," and even the words *STEWED PORK* printed in large black letters on the improvised drinking cup.

These "good giants," the scouts who have found him, surrounded Vanya with an atmosphere of happiness that made him gradually forget those endless days of loneliness and homelessness. "Three years Vanya lived the life of a stray dog, with no home to go to, with no parents to welcome him. He feared people and constantly suffered from hunger and unending terror." Katayev does not describe in detail all that the boy had lived through on the territory occupied by the Germans, but this is intimated in the restlessness of his sleep, full of nightmares and tears, in his deadly hatred of Germans, in the grit he displays in his meeting with the enemy, and in the joy he feels at the moment when his childish hand sends a shell whining into the enemy's territory.

The same reserved expressiveness marks those parts of the story which deal with Vanya Solntsev's new-found friends. Katayev has a finely developed sense of humour—kindly, friendly, sympathetic. He keeps a straight face while joking about the scouts' famous tea-kettle of gargantuan proportions, about the meeting between Vanya, who has not yet received his uniform, and a boy of his age, the "son" of the cavalry regiment, all dressed up in a resplendant guards' uniform, about how his "foster fathers" teach him the correct method of donning his boots.

These army scenes are full of warm sincerity. This sincerity is especially evident in the relations between Captain Yenakiyev and his

men, in the sharp distinction between "official" and "unofficial" dialogue. Strict discipline combined with high conscientiousness and spiritual intimacy, is what binds the Red Army from private to Marshal into an invincible fighting body.

His few months' sojourn among the soldiers of the Red Army made the hero of the story a man, brought out his best tendencies and traits of character. He returned to peaceful life with his soul open to kindness.

But Katayev uses not only soft, warm tones in his story. His narrative is about war, and that is why harsher colours often appear in it. Just at the moment when one of the scouts, Gorbunov, is merrily explaining something to Vanya, Sergeant Yegorov comes into the tent and orders the scout to go out and take the place of Kuzminsky, who has just been killed, in the infantry file.

"Our Kuzminsky?" asks one of the soldiers. "Yes, shot down by a Tommy-gun. Eleven bullet-holes. Hurry up!"

"Yes, sir."

Vanya had caught a glimpse of Kuzminsky that morning as the latter was leaving for the battle-field. "He had gone without saying goodbye to anyone, like a man who intends to return very soon. Now they all knew that he would never come back again, and they stared in silence at the empty place that had been his.

"An air of loneliness and gloom settled down over the men in the tent."

Thus, the cold, pitiless breath of death comes into the story.

It is precisely this combination of seriousness and humour, of brightness and gloom, of joyousness and sorrow, that makes Katayev's story so successful.

BALZAC'S BOOKS IN THE U. S. S. R.

On the Ninety-fifth Anniversary of His Death

By *I. Dyushen*

FRENCH literature is well known in the U. S. S. R. In the period from 1917 to 1944, for instance, the works of four hundred and ten different French writers were published in the Soviet Union. According to approximate data, these editions were printed in a total of 46,396,400 copies. Particularly large printings were made of the works of Jules Verne, whose books have gone through 191 editions with a total printing of 4,163,600 copies; of Victor Hugo—223 editions with a total printing of 3,952,000 copies; of Maupassant—219 editions, with a total printing of 3,780,100 copies. Printings of Zola's works have reached a total of 2,458,000 copies, those of Anatole France 1,864,000 copies and Balzac 1,814,090 copies.

More than a century has passed since Balzac became famous in Russia. In this country he

acquired a new circle of readers and new students of his writings. The popularity of his works in the U. S. S. R. testifies to the wide range of cultural interests among Soviet people. The latter appreciate and know Balzac as a creative artist, prodigious thinker, a poet of labour, will power and energy who was able to say "No" to everything evil and base and to proclaim his principles of true faith—faith in a harmonious human individuality, faith in progress, in mobility of character and in the power of goodness. To this day Balzac's books stir the hearts of their readers and call for active and vital participation in life. The humanism of Balzac's art which is unaffected by the passing of time, gives him the right to accompany each new generation as it takes its first conscious steps in mature life.

Sergeant Vladimir Spiridinov, a student at the Stalingrad Civil Engineering Technicum before the war, carried his best loved books with him through all the campaigns he took part in as a Redarmy man. His personal library on the march consisted of only a few books—a volume of Chekhov's stories, a one-volume edition of Mayakovsky's poems, Balzac's *Eugenie Grandet*, Sholokov's *And Quiet Flows the Don*, and one or two others.

In each of the books was a sheet of paper covered with names written in pencil and in ink in various hands. These were the names of Spiridonov's pals who signed up on the waiting list for these books. On the sheet placed in the copy of *Eugenie Grandet*, one of the soldiers wrote the following words beside his name, "What a tremendous soul this writer has!"

The first Russian translations of Balzac's works appeared in 1832. In the 1890's all the separate translations were collected into a twenty-volume edition of his works. He acquired his greatest popularity, however, in the second decade of the twentieth century. Since the establishment of the Soviet government in 1917 Balzac's works have been published in eight languages of the peoples of the U. S. S. R. in a total printing of 1,814,090 copies. His novel *La Peau de Chagrin* was published in six Russian editions—in 1923, 1928, 1931, 1932, 1935 and 1936. In 1929 it was published in the Ukrainian language and in 1931 in the Georgian language. The total printings of these editions ran into 161,450 copies. Balzac's novel *Le Père Goriot* went through twelve editions in the Russian, Ukrainian, Armenian, Jewish and other languages in the period from 1927 to 1940. A special edition of this novel was published in the original French for students. These various editions had a total printing of 102,550 copies. *Eugenie Grandet* which was first translated into Russian by Dostoyevsky, an ardent admirer of Balzac, has gone through four editions in the last few years with a total printing of 100,300 copies. *Illusions perdues* has been published in two editions with a printing of 36,870 copies and *Les Paysans* in five editions with a printing of 121,370 copies.

Balzac's stories *Gobseck*, *Le Colonel Chabert* and others are also widely known in the Soviet Union. *Gobseck* appeared in eight editions in the Russian, Ukrainian, Byelorussian and French languages in the period from

1924 to 1939. The total printing of these editions reached three hundred thousand. In 1936 and 1938 100,000 copies of this story were issued. *Colonel Chabert* appeared in edition with a total printing of 115,000 copies.

In the decade from 1935 to 1945 the State Literature Publishing House has brought out three editions of Balzac's collected Works in twenty volumes. These editions include all of Balzac's novels comprising the *Comédie Humaine*. Many of the novels were translated anew for this edition. The collected works were issued with a critical article on the life and works of Balzac and detailed literary and bibliographical notes. Many Soviet translators and literary critics collaborated in preparing this edition for the press. Griftsov, one of the translators of Balzac's novels, was awarded the Order of the Badge of Honour by the Soviet Government in 1939 for his literary work.

Even such tremendous printings as those just mentioned are unable to satisfy the constantly growing interest of Soviet readers in Balzac's works.

The State Lenin Library whose reading rooms are visited by more than two thousand readers every day, has six hundred and fifty volumes of Balzac's works in its collection. Two hundred of these were published in France and Russia during Balzac's lifetime.

A study made especially for the present article by the staff of the Lenin Library showed that more calls are turned in by readers for French literature than for any other European literature. Balzac is the most popular of the French authors of the nineteenth century. An average of eighty volumes of his works are given out to visitors in the reading room every day.

At the library for the workers of the Stalin Automobile plant in Moscow one copy of Balzac's novel *Illusions perdues* was read by fifty-six people in 1944, *La Peau de Chagrin* by forty people and a two-volume edition of his stories by thirty-nine people. Despite the fact that this library possesses many copies of Balzac's works the books rarely gather dust on the shelves as they are in constant demand.

In the U. S. S. R. Balzac is known not only as a novelist but as a playwright as well. His plays figure in the repertoires of many large Soviet theatres. *La Marâtre*, for instance, is

one of the most successful productions of the Yermolova Theatre in Moscow and also of the Leningrad Drama Theatre and the Russian Drama Theatre in Kiev. *Pamela Giraud* is a current production at the Leningrad Theatre of Comedy.

Russian dramatisations of some of Balzac's novels are particularly interesting. The Moscow Maly Theatre undertook a dramatisation of *Eugénie Grandet* in 1939, which proved very successful. It has been in the Theatre's repertory ever since and in March 1945 the theatre gave the three hundredth performance of this Balzac production.

P. Sukhotin, one of the finest specialists on Balzac in the U. S. S. R. and the author of a monograph on Balzac, did a very original dramatisation for the Moscow Vakhtangov Theatre in 1934. This was a production in which all the main characters of the *Comédie Humaine* were brought on the stage. Despite the involved problems it presented from the point of view of stage technique, this production had a successful run.

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Balzac's progressive significance as a leading writer of the nineteenth century who boldly proclaimed the principles of realistic art did much to determine the success which he has enjoyed in Russia from the 'forties of the last century to the present day.

The young Russian critic Belinsky, who won recognition in the 1830's with his first article called *Literary Dreams* referred to Balzac in this article as a writer with a marked talent for realistic art. "Look at Balzac," he wrote, "how much he has written and yet it is impossible to find a single character or a single person in his books who in any way resembles another. O, what a marvelous art of describing characters with all the fine shadings that lend them individuality!"

Balzac's popularity continued to increase in the 1840's. His books were read in Herzen's circle. Dostoyevsky began to translate them.

"Balzac is a great writer," wrote Dostoyevsky in 1838. "His characters are the production of the mind of the universe! Not the spirit of the time but whole millenniums prepared the ground for such a talent as Balzac's."

Leo Tolstoy soon joined the ranks of Balzac's warm admirers. When in Paris in 1857 he made the following entry in his diary:

"Read *Honorine*. Tremendous talent." A letter he wrote from Yasnaya Polyana to Moscow in 1882 contains the following line: "Took a book by Balzac with me and am enjoying reading it in my leisure moments."

Each generation of Russian writers discovered new qualities in Balzac's works. In 1911 Maxim Gorky wrote that "Balzac's works are especially dear to me because of the love for people and the marvelous knowledge of life which I always sense with such intensity and joy when I read them." (Published in the magazine *Le Rêve*, No. 14, June 15, 1911.)

In Balzac's works, with their world of private ambition and greed, petty passions, lost illusions and trampled human dignity the Russian reader discerns the personality of the poet himself, deeply moved by the vital drama which he depicts and by the fate of his characters, even when they are bad. The Russian reader regards Balzac as a poet far removed from rational objectivity, untainted by feelings of misanthropy and so able to formulate his own credo and faith in man, in nobility of character, in goodness and progress, faith in the integrity of that human individuality so dear to contemporary readers of the *Comédie Humaine*.

In the U. S. S. R. Balzac is an object of great interest to specialists in literature as well as to the general reading public. His writings have been the subject of a number of lengthy researches by Soviet scholars concerned with the development of nineteenth century French realism. The most interesting of these works are the monographs by V. Grib (1940) and P. Sukhotin (1934), A. Gerbstman's *The Theatre of Balzac* (1938) and B. Reizov's *Balzac's Works* (1939).

The preface to the English translations of Grib's monograph, published by the *Critics Group*, recommends this study as the best guide to a study of Balzac.

The preface remarks that Grib offers a concrete illustration of the depth and scope of Marxist criticism.

All these monographs are independent researches in which the analysis of Balzac's works is closely bound up with a characterisation of French social and literary life in the 1830's and 1840's. The authors give considerable attention to a description of the creative method used by Balzac, who, as the founder of the realistic school in French literature, spent many years seeking his own

individual style as a writer and in surmounting the romantic tradition.

Soviet researchers have studied the incongruities and dialectic contradictions between the world outlook of Balzac, the legitimist, and the creative method of Balzac, the realist. They have drawn attention to the fact that the objective significance of Balzac's profoundly critical work is in sharp contradiction to his political views and ideals. Balzac the artist was more objective than Balzac the thinker. In his *Comédie Humaine* the creative method of the realist compelled him to combine sympathy for the aristocracy with a realization of their inevitable downfall. In the same way his monarchistic views are counterbalanced by an undisguised sympathy for the republicans to whom he looked as the sole leaders of the people.

"The term 'legitimism' only partially and superficially coincides with the actual content of Balzac's social and political views", V. Grib points out in his monograph. "Although he champions the nobility, Balzac was by no means a writer of the nobility, either in his personal aspirations or in the objective results of his work. The actual foundation of Balzac's outlook on the world was a sharp, ruthless criticism of bourgeois reality.

"It was neither a legitimist, nor a conservative, nor a royalist who discussed the life of contemporary France in the *Comédie Humaine*," Grib goes on to say. "It was Balzac the realist and humanist, able to rise above the caste interests of his political party who strove to expose the innate contradictions of this life."

A substantial place in the works of Soviet researchers is given over to a characterisation of Balzac's aesthetic views. V. Grib has compiled a large volume (527 pp.) entitled *Balzac On Art* in which are collected Balzac's utterances on aesthetics.

This volume, published in 1941, is divided into three parts. The first, which bears the general heading *The Essence of Art*, contains Balzac's preface to the *Comédie Humaine*, his *Study on Bayle*, *Letter on Literature*, *Theatre and Art* and his articles *On Artists* (1830) which are published for the first time in Russian in this volume. This part of the work contains views on aesthetics which Balzac expressed in letters written in 1829, 1831 and 1845, in the preface to *La Peau de Chagrin*, in the novels *César Birotteau*, *La Cousine*

Bette, *Seraphita* and in the stories *La Recherche de l'absolu*, *La Duchesse de Langeais*, and *Gambara*.

The second part of the volume, *Art and Society*—opens with Balzac's review of La-touche's novel *Fragoletta* (1829) in which he first expressed the idea that "literature is the expression of society." This part of the volume contains all Balzac's utterances on the feudal-aristocratic and bourgeois epoch in the development of art and society, on the duality of bourgeois civilisation, the development of individuality in nineteenth century society, the bourgeoisie and the bourgeois type of artist and bourgeois society as a subject of artistic work. Balzac's *Letter to French Writers* (1843) is published in Russian for the first time in the second part of this volume.

The third part of the volume is entitled *Remarks on the History of Art and Literature*. It contains Balzac's utterances on Greek art, Dante, Renaissance art, French classicism (Balzac's article on Molière appears here for the first time in a Russian translation), the French romantics (first translations of Balzac's articles on Hugo's *Hernani* and *Les Litanies romantiques*). Then come Balzac's utterances about Saint-Beuve, Gautier, Dumas-père, Sue, Walter Scott, Stendhal, Sand, Scribe and articles on nineteenth century music and painting.

This volume compiled by V. Grib shows the great attention paid to the study of Balzac in the U. S. S. R. This book is meant not only for literary critics and scholars but for students as well.

Balzac's works are studied in all liberal arts colleges. Courses in West European literature usually allot ten lecture hours to Balzac's works. Students majoring in literature and education take special courses in Balzac and in French realism.

During the war many interesting new researches on Balzac were written by young Soviet literary critics. In 1941 and 1942 two graduate students at the Moscow University submitted dissertations on the theme *How Balzac Came to Write the "Comédie Humaine"* and *The Aesthetic Views of Balzac and Hegel*. Graduate students at Moscow pedagogical institutes are working on dissertations on the following subjects *The Main features of Balzac's Realism*, *Balzac and the Traditions of the Epoch of Enlightenment*, *Balzac's Philosophical Views*, *The Sources of Balzac's Rea-*

lism and *Balzac and Hoffmann*. Two of the leading Soviet literary critics V. Grifitsov, editor of Balzac's collected works and M. Eikhengolts are also engaged in writing monographs on Balzac.

The staff of the Moscow Library of Foreign Literature has prepared a bibliography on Balzac soon to be published. It will contain information on the best French editions of Balzac's works and on all the editions of his works published in the U. S. S. R. It will also contain an annotated list of critical literature on Balzac.

Balzac's personality has always interested leading Soviet writers. Among the best literary studies written in a popular style is that of Leonid Grossman called *Balzac in Russia* (1937). This large work is based on hitherto unpublished material. It presents a picture of Balzac as he appeared to his Russian contemporaries in 1843, 1847 and 1849—1850 during his visits to St. Petersburg, Kiev and Wierzschovnia, Countess Hanska's estate in the Ukraine. "Russia first saw Balzac," writes Grossman, "as a man of middle age, worn out by his superhuman exertions but still engrossed in vast plans. He was already well known but still dreamed of fame and fortune as he had at the age of twenty in his garret room in Paris."

Grossman points out that Balzac's stay in Russia and the Ukraine should not be regarded as merely an episode in his personal life. It was not only the desire to see Mme. Hanska that drew Balzac to the North. "His last illusion was the compelling force in bringing him to Russia," writes Grossman. "He had dreams of accomplishing here what he had failed to do in Paris under Louis Philippe."

At the end of his book, which is the first attempt to collate all the material in the U. S. S. R. about Balzac's visits to Russia, Leonid Grossman notes that Russia never appeared as a theme in Balzac's works. Balzac first arrived in Russia shortly after the death of A. Pushkin and came in contact with a number of people who had known the poet.

Among them were Mme. Hanska, who had met Pushkin in Odessa and whom Pushkin had called Atala, the name so frequently encountered in Balzac's letters; her sister Korolina Sobanskaya, to whom Pushkin dedicated his poem *Why Do You wish to Know My Name?* and Alexander Turgenev. During the course of Balzac's friendship with Mme. Hanska Pushkin and Lermontov were killed in duels, Belinsky died of tuberculosis. The young writers Gogol, Dostoyevsky, Turgenev, Goncharov, Herten and Ostrovsky were just making their appearance in literature. Zhukovsky was rounding out his career, Nekrasov was only beginning his. What did Balzac know of the great writers of the country in which he spent almost two years? This question has not been studied as yet by modern researchers on Balzac.

Balzac apparently did not have sufficient time to work over the new impressions gained from his visits to Russia into his writings. Although he referred to his tremendous popularity in Russia he could hardly have realised the true nature and extent of this popularity. And yet Russia, the country in which he felt so lonely even in the home of a person near and dear to him, offered Balzac unreserved fame, fame that has lived unfading through a whole century.

This book by Leonid Grossman is supplemented, so to speak, by a novel recently written by Natan Rybak, a contemporary Ukrainian writer. In this novel, called *Balzac's Mistake* (1941) the author points out that a first hand acquaintance with life in the Ukraine, enslaved by tsarism, dealt the last blow to the great realist's monarchistic leanings and completely shattered his legitimist principles. Rybak's novel paints a life-like portrait of Balzac. The reader sees him as a man who understood the spirit and the life of the people, Rybak presents Balzac as a realist, who found his inspiration in the wisdom of the common people, and who realized, at the end of his life, the great disparity between the realistic tendency of his progressive art and his political credo.

LECTURES ON PROBLEMS OF HIGHER
NERVOUS ACTIVITY

Orbely L. A., Acad.

Moscow—Leningrad, Academy of Science Publishing House, 1945, pp. 207.

THIS BOOK is a thematic collection of 12 lectures by one of the greatest representatives of the Pavlov School of physiology. The author also happened to be one of Academician Pavlov's most intimate pupils and disciples.

The first part of the book contains six lectures on problems of higher nervous activity, delivered by Orbely in 1938 before the professors, teachers and students of the 1st Leningrad Institute of Medicine. These six lectures made up a series under the general title of: *I. P. Pavlov's Theory of Conditioned Reflexes*. The second part of the book contains five lectures delivered by Orbely before gatherings of biologists and physicians. One of them was delivered on the occasion of the fifth anniversary of the death of I. P. Pavlov in 1941; three were delivered respectively at the Third, Fifth and Seventh All-Union congresses held to discuss problems of higher nervous activity, and one lecture was delivered at the grand joint meeting of the Academy of Sciences of the U. S. S. R. and VIEM (the All-Union Institute of Experimental Medicine) in 1937. These five lectures were on the following subjects: 1) *The Scientific Heritage of Acad. I. P. Pavlov and Prospects for its Further Development*; 2) *Research Work in the Field of Higher Nervous Activity Carried on in the Institute of Physiology and the Pavlov Biological Centre at Koltushy*; 3) *The Physiological Basis of Delirium*; 4) *The In-*

fluence of Extracortical Factors upon Higher Nervous Activity; 5) *The Theory of Evolution as Applied to the Physiology of the Central Nervous System*.

In the foreword, Orbely writes that in his lectures his purpose was "to present the basic facts of Pavlov's theory, to draw the attention of the audience to the most important points in this theory and to show its great value in those fields of science for which it forms a basis or a window through which may be viewed hitherto unknown prospects. It was these prospects that most interested the author himself since the success of future work depends on whether these prospects are ever realised or not.

At the same time it was important to accord Pavlov's theory its proper place in the system of scientific knowledge as a whole, in order to combat the many false interpretations given to it by over-enthusiastic supporters on the one hand, and over-severe critics on the other. These latter, besides not knowing the subject themselves, make use of the blunders and exaggerations of the former" (p. 3).

Orbely's book will surely occupy a prominent place among that large section of the world's scientific literature which deals with the theory of conditioned reflexes founded by I. P. Pavlov and his extensive school. It is written by a direct participant in Pavlov's remarkable work, by one who has devoted to the science of physiology his own personal

talent as research-worker and thinker. All this makes Orbely's book of great interest.

The first six lectures represent a strictly consecutive exposition of Pavlov's theory, beginning with the great physiologist's first steps, when he established the remarkable phenomenon of *psychic secretion* of the salivary glands of a dog, and ending with the present day, when the theory of conditioned reflexes has grown into a vast, many-branched section of biology and physiology, directly connected with medicine and psychology. In a form popular enough for any reader with a general knowledge of natural science to understand, the author describes in detail all the stages of Pavlov's work, illustrating his exposition with interesting episodes from his own experiences and those of his collaborators in Pavlov's laboratories. The reader gets a good idea of the apparatus and methods of work used in Pavlov's school, of the importance of experiments on conditioned reflexes, of the triumphs and the difficulties lying in the path of mastering the extremely complex laws of higher nervous activity first discovered by Pavlov and his pupils.

In the lecture *The Scientific Heritage of Academician I. P. Pavlov and Prospects for its Further Development*, Orbely characterizes the extraordinary variety and wealth of this heritage, which is due largely to the fact that Pavlov himself was an encyclopedist in physiology. According to Orbely "during his 50 odd years of investigation he worked in all the most important branches of physiology. It may be said without hesitation, that there was no physiological problem in which Acad. Pavlov was not interested at some time during his life, and that there is not a physiological problem today which does not bear deep traces of his active creative investigation... On the whole, he turned his attention, his creative talent to all branches of experimental physiology" (pp. 131—132). Pavlov founded a new, extremely valuable technique in surgery, *physiological surgery of the alimentary canal*, as he called it. "He should be considered the founder of experimental surgery," writes Orbely. "Not in vain did the first official representative of this science, Carrel, consider I. P. Pavlov his teacher and the founder of experimental surgery" (p. 133).

Orbely writes in detail about Pavlov's heritage and its future, emphasizing that it has not yet been sufficiently studied. "Most of the

experimental data gathered, most of Pavlov's ideas and conceptions some of which have already been made public, others of which are still in project, remain concealed in the vast number of publications comprising the dissertations, articles and other works of his pupils. At present it may be said without hesitation that this vast literature, as yet largely unknown to scientists abroad, represents a major part of Pavlov's heritage. It contains innumerable questions, problems, ideas, and scientific projects" (p. 134).

Pavlov was the first scientist in the world to build up *the true physiology* of the central nervous system on the basis of a profound conception of the unity of the processes of excitation and inhibition. He "considered excitation and inhibition two manifestations of a single neural process. Taking a condition of equilibrium between these two poles of the neural process as his basic standpoint, Pavlov drew a picture of the work of the higher organs of the central nervous system as a constant shifting system of mosaics composed of centers of prevailing excitation or prevailing inhibition. This constant interchanging of excitation and inhibition is brought about, as Pavlov showed, by a series of tendencies, viz., the tendency of excitation to pass into inhibition, and the tendency of inhibition to pass into excitement, the tendency of both of these processes to build up a zone of the opposite manifestation around the initial point to induce the opposite process into the surrounding zones... Then Pavlov emphasized the importance of the dispersion of these two processes throughout nerve matter, their tendency to spread out from the initial center into neighbouring centres and even to those far removed. This is followed by a tendency to reconcentrate, i. e. to draw the process back to the point of origin. This accounts for the endless changing of the tessellated picture, for that diversity of relations which we discern at any given moment" (pp. 140—141).

After studying a vast number of animals (dogs), Pavlov established that they can all be divided into four types according to the peculiarities of their nervous processes. In its main points Pavlov's theory of the types of the nervous system coincides with the old theory of four temperaments in man (choleric, sanguine, melancholic, and phlegmatic). This theory has proved very useful in human neurology and psychiatry: for the first time a

strong physiological foundation was laid under the conceptions of temperaments and of types of nervous systems. Having set himself the purpose of solving the problem of the hereditary nature of the nervous system, Pavlov hit upon the idea of organizing a special laboratory for the genetic study of higher nervous activity. In this way a biological centre was founded at the village of Pavlovo (formerly, Koltushy) near Leningrad. At this centre the evolution of nervous activity is studied in a large number of animals whose nervous systems belong to various groups—from simians to birds.

A whole chapter of the book is devoted to the work of this biological centre (pp. 149 till 159).

Having met, as was inevitable in the course of his experiments, with disease phenomena in the nervous systems of the dogs he experimented with, Pavlov established that

in principle these phenomena were similar to neuroses in human beings. Hence Pavlov's great and ever increasing interest in neuropathology and psychiatry, which brought the great physiologist to the clinic. This work resulted in Pavlov's remarkable papers: *A Test of the Physiological Conception of the Symptomatology of Hysterics*, *A Physiologist's Adventure into the Field of Psychiatry*, etc.

Pavlov's attempts to give a physiological explanation for delirium are of exceptional interest. Orbely devotes one of the most interesting chapters of his book, *The Physiological Basis of Delirium* (pp. 160—172), to a discussion of Pavlov's work in this field, "the most difficult and complex to explain on the basis of physiology." In this chapter, just as in all the others, Orbely shows convincingly how great are the achievements of Pavlov's theory, "whose basic problem is to comprehend the subjective world within man" (p. 205).
